OCTOBER, 1961

ARMED FORCES Management

PUBLISHED FOR THE MILITARY SERVICES OF THE FREE WORLD

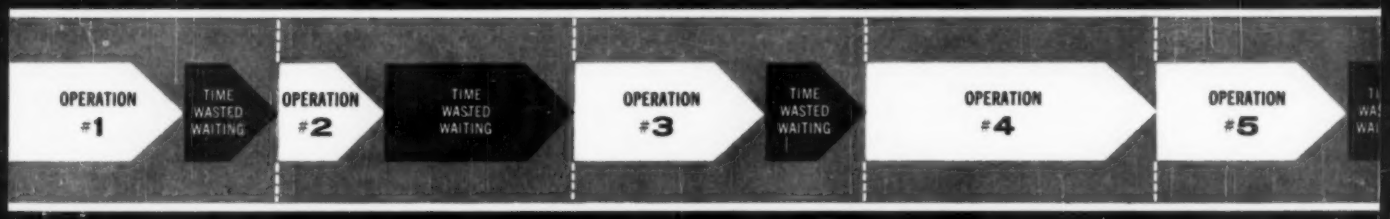
NATO:

"UNITED WE STAND..."

New steps towards united planning of the research, development, and buying of weapons:
Pages 17 and 20

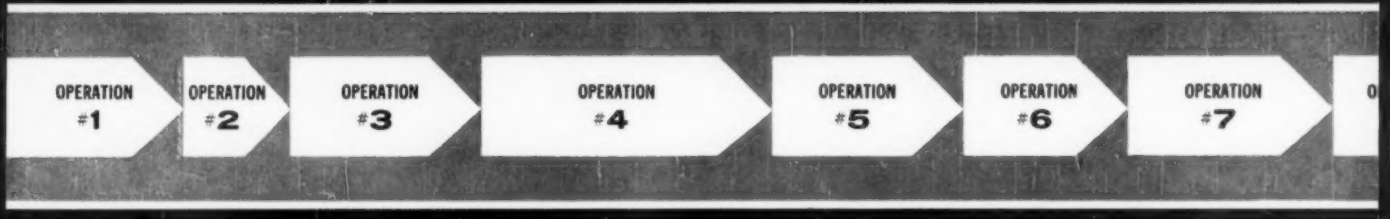
Your Computer is Wasting Time and Money!

[unless it's asynchronous]



SYNCHRONOUS

Synchronous computers waste time waiting!



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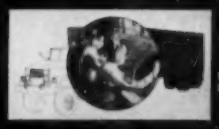

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In My Opinion

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. . . to reproduce and distribute throughout this command the article, "Mark Bradley's Money Tree," which appears in the August 1961 issue of ARMED FORCES MANAGEMENT. Your magazine will be acknowledged as the source of the article in the reproduction, and no attempt will be made at pecuniary gain from its reproduction or distribution.

As the Air Force's newest major air command, we are now in the process of establishing our "Money Tree" program. We consider your article to be an excellent explanation of this program, and we wish to use it in emphasizing to our field units the need for active participation in the program.

Col. William J. Worcester, USAF
DCS/Logistics
Hdqtrs, AF Communications Service
Scott AFB, Ill.

Clear Now

In the excellent compilation in your July issue on the Comparison of Major Computer Systems, we note that your listing of the RPC-4000, RPC-9000 and the LGP-30 computers indicates they are manufactured by Royal McBee Corporation.

Actually, these computers are manufactured by General Precision-Librascope, a Division of General Precision, Inc. and marketed through Royal Precision Corporation by the EDP Division of Royal McBee. Royal Precision is jointly owned by Royal McBee and General Precision Equipment Corp.

I recognize that this is rather a complex relationship to try to explain, but we do hope that it is now clear to you. Rest assured the above does not constitute any diminution of a very excellent comparison summary.

Norman Wicks
General Precision Equip. Corp.

Outstanding

Many thanks for sending us . . . copies of the July, 1961, issue of ARMED FORCES MANAGEMENT. These copies are being distributed throughout our marketing organization, and I know they will be well received.

Of course, you are to be congratulated on the fine article on the U.S. Naval Postgraduate School and the project NANWEP. I was also very much interested in your story of Captain E. C. Svendsen's role in the NTDS.

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Sales Promotion
Control Data Corporation

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Published monthly by American Aviation Publications, Inc. 1001 Vermont Ave., N.W. Washington, 5, D.C. Telephone: STerling, 3-5400. Cable AMERAV. Unsolicited manuscripts should contain a self-addressed return envelope. Responsibility is not assumed for the return of any unsolicited material. Printed at the Telegraph Press, Harrisburg, Pa. Controlled circulation postage paid at Harrisburg, Pa. Copyright 1961 by American Aviation Publications Inc. Reg. U.S. Pat Off. Four week's notice before next publication date required for change of address. Subscription Price: $10.00 a year in U.S. and Canada, $15 overseas, single copy price $1.

The Timorous Tempest

RECENTLY, sometimes with the almost grotesque hesitancy of a carpenter performing brain surgery, one or two amateur authors in military-oriented publications have been lightly bopping about the ears this idea of management vs. command. Their theme, essentially: "over-emphasis" or running a smart business in the commander's office is sullying the military garments of the old, justifiably proud, and still active, gung-ho war horses. Their inference: generals and admirals can't fight wars and run businesses too.

Fortunately, a growing multitude of the human resources on the defense-industry team are no longer apprehensive about the possibility that someone may be trying to skewer their pride in their chosen specialty by asking them to use another specialty (their brains) to run it. Doctors, druggists, lawyers, automobile manufactures and lots more on the private industry side of the economy have been accepting, and profiting by, the advice for a long time. And the advice is just as valid for the commander of a B-52 Wing as it is for the manager of a grocery store.

These columns have long echoed the contentions of many sharp, far-sighted military officers that no amount of *ordering* is going to create hardware if the business side of the operation is half asleep and riddled with roadblocks; few commanders will have a prayer of winning wars—the support operation is all snarled up. In sum, particularly in these cold war times, how effectively we manage our available resources and re-shape them to meet the Soviet challenge (particularly in a Democratic vs. Totalitarian system of making decisions) is going to determine almost entirely whether we survive or not.

Actually, all today's smart Defense personnel have really been doing in recent months is re-phrasing, embellishing and/or polishing the advice given the Free World nearly 20 years ago by British Field Marshal Montgomery when he said, "Winning wars is 25% strategy and 75% logistics."

Thus, McNamara's hard-driving defense team is not merely indulging in a time saving exercise, but is actually trying to soup up the defense engine to where it can fight several times more effectively; Hitch's program packages are not just an economist's effort to juggle some figures and cut costs, but an attempt to give McNamara and the Joint Chiefs the kind of sensible information they have long needed in order to make the right decision fast; and the Pentagon's base closure program is not a drive just to save dough, but to shut off the drain in men, money and material being wasted running military marginal bases.

It is encouraging to see several signs in recent months that, by inference, the grumblers haven't succeeded in their de-emphasis program. Among the clues: the recent impressive success of the Armed Forces Management Association (with which this magazine has a close and obvious working relationship) in adding to its member lists the very top decision makers in the military. One of their key reasons for joining: a strong desire to spread around knowledge of new business ideas and techniques for running the shop better, both in the military and in defense industry.

Hopefully, such impressive forums as the up-coming AFMA conference will go a long way toward helping to ease the headache.

C. W. Borklund

He's solving a real estate problem

This AMF engineer's job is determining how best to move big missiles off shore for launching. Should they be floated out horizontally, flooded to an upright position, and then launched? Or, would it be more feasible to barge them out? Might they be moved to or assembled on "Texas Towers," or would a causeway or simply land-fill be the answer?

Behind the project is our shrinking real estate at launching sites, plus the hazards inherent in launching Saturn-sized missiles (and the coming, nuclear-powered missiles) near other installations. Off-shore launching may be the answer.

Feasibility studies of all types are an AMF specialty. What kind of remotely controlled machinery is required to service nuclear-powered aircraft? What kind of habitation could be built on (or under) the surface of the moon? What sort of machines (manned and unmanned) could survey the moon's surface without, for example, falling into a fissure? What is the best way to assemble a space station? All these are problems AMF engineers are presently investigating.

If your problem is the first of its kind, AMF will not, of course, have met it before. But AMF's long experience in accepting totally unique challenges gives it an advantage enjoyed by few other organizations concerned with ground support, launchability and space environment. To get further information write American Machine & Foundry Company, 261 Madison Avenue, New York 16, N. Y.

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ARMED FORCES Management

PUBLISHED FOR THE MILITARY SERVICES OF THE FREE WORLD

OCTOBER, 1961

Volume 8—No. 1

FEATURES

NATO: "United We Stand . . . . "

U.S. Acts To Unite NATO 17

Recognition of West Europe's growing ability to develop and produce modern weapons has forced U.S. planners to accept NATO allies as industrial partners. Joint planning and foreign U.S. purchases are expected to end present wasteful duplication.

NATO's Technical Centers 20

A progress report on NATO's three technical centers, set up to study technical problems through international co-operation, and a listing of some of the more significant results.

Military-Civilian Working Relationships, Part II 26

An analysis by a career Army officer of the growing day to day problems.

Can Management Control Reliability? 30

An analysis by a major defense contractor on how to secure reliability on a major weapons development and still meet the urgent deadlines.

Technical Staffs—Losing Prestige? 34

A breakdown in communications between technical staffs and military management sometimes transforms a scientific advisor from an asset into a liability.

Navy Leadership Training: Poor Methods? 38

A controversial article published without Navy sanction criticizes the guided discussion and role-playing techniques of present Navy leadership training courses, and suggests alternative methods.

Pentagon Profile—

This Month: Brig. Gen. Alvin C. Welling . . . 42

Presently Deputy for Site Activation, U.S. Air Force Ballistic Systems Division, this Army Corps of Engineer Officer is playing a vital role in the program to speed up construction of the ICBM missile sites. His position as an Army officer working for the Air Force, brought about by the unification of the missile site activation program, is not only unique, but has proven successful.

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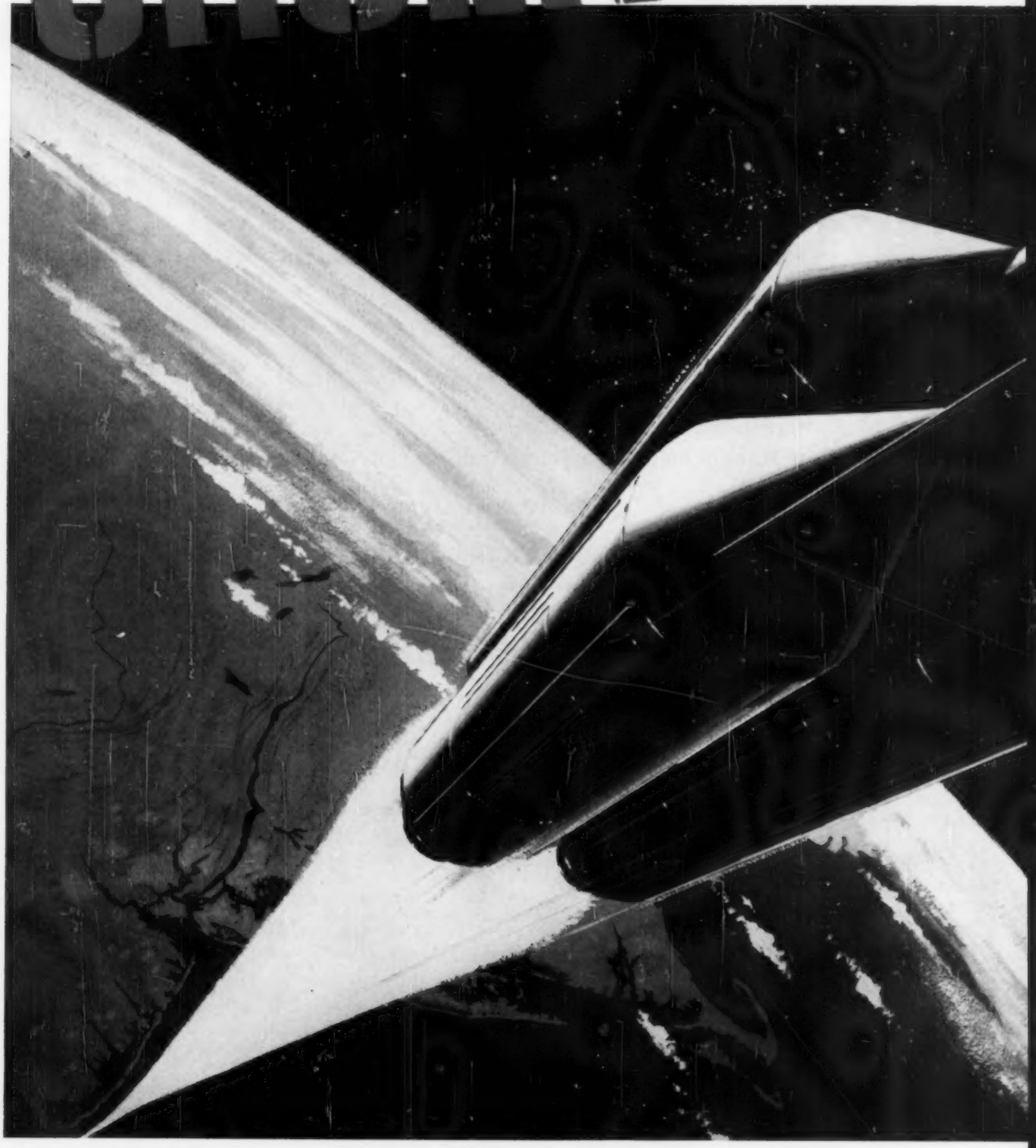
NEXT MONTH:

This is the Department of Defense—Special Annual Report on Defense organization and operations.

URGENT: PACK



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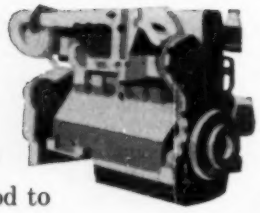

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WASHINGTON, D. C. PEORIA, ILLINOIS

RESEARCH • DEVELOPMENT • MANUFACTURING FOR DEFENSE

The View From Here . . .

Poor Season For The Defense-Industry Team

Pentagon publicists extolling the harmonious relationship within the so-called "Defense-Industry Team" had better look to their superiors for some action to make this fiction come true or be prepared to watch the deterioration of what is already an unhealthy situation.

A check with DOD contracting officers and industry representatives reveals that contrary to sweetness-and-light statements about the Defense-Industry relationship, a list of neighborhood gripes is growing rapidly on both sides of the back fence, including:

> Defense—"It's about time industry got off its back side and went to work."
>
> Industry—"Before we can produce at our best, Defense has got to straighten out the way it makes us do business."

Unfortunately for the team members there has been little action to back up the new DOD team's good intentions. Hardly anyone in Pentagon positions of power has a comprehensive plan for making the team work the way the press releases say it does.

Secretary McNamara's challenge to industry for greater efficiency and cost reductions are reasonable demands for a customer to make. But he must put his own house in order before industry can respond.

Item: Instituting "greater risk" contracts in place of cost-plus-fixed-fee contracts is sound, placing a greater responsibility on industry for an efficient, error-free performance. But coupled with the greater risk must be an assurance that resulting profits will not be taken away thru "Renegotiation."

Item: Defense must change its present regulations in order to eliminate the present staggering costs of formulating a bid proposal. In addition to the almost inestimable cost in manpower and resources, just the preparation and presentation (to too many people at too many different places) of the document now runs into millions on larger contracts. Sooner or later this needless expense is borne by Defense and ultimately the taxpayer. There must be a simpler way of doing business.

Item: Industrial espionage. Before Defense can expect to get clear proposals on contracts, the leaks must be plugged which allow companies to see the competition's proposals and to steal the best portions for their own bid.

Demands for greater efficiency and cheaper products must be coupled with an elimination of those present practices—which the above list does not begin to enumerate—that make it difficult for industry to do business with the Defense establishment.

Until Defense puts its own house in order, it can hardly expect to draw a 100 percent effective performance out of the other half of the team.

Time To Unify People

We are still waiting for the new Pentagon team to do something about the horrendous hodgepodge of personnel regulations that give different pay, rank, grades, and retirement privileges to people doing the same job.

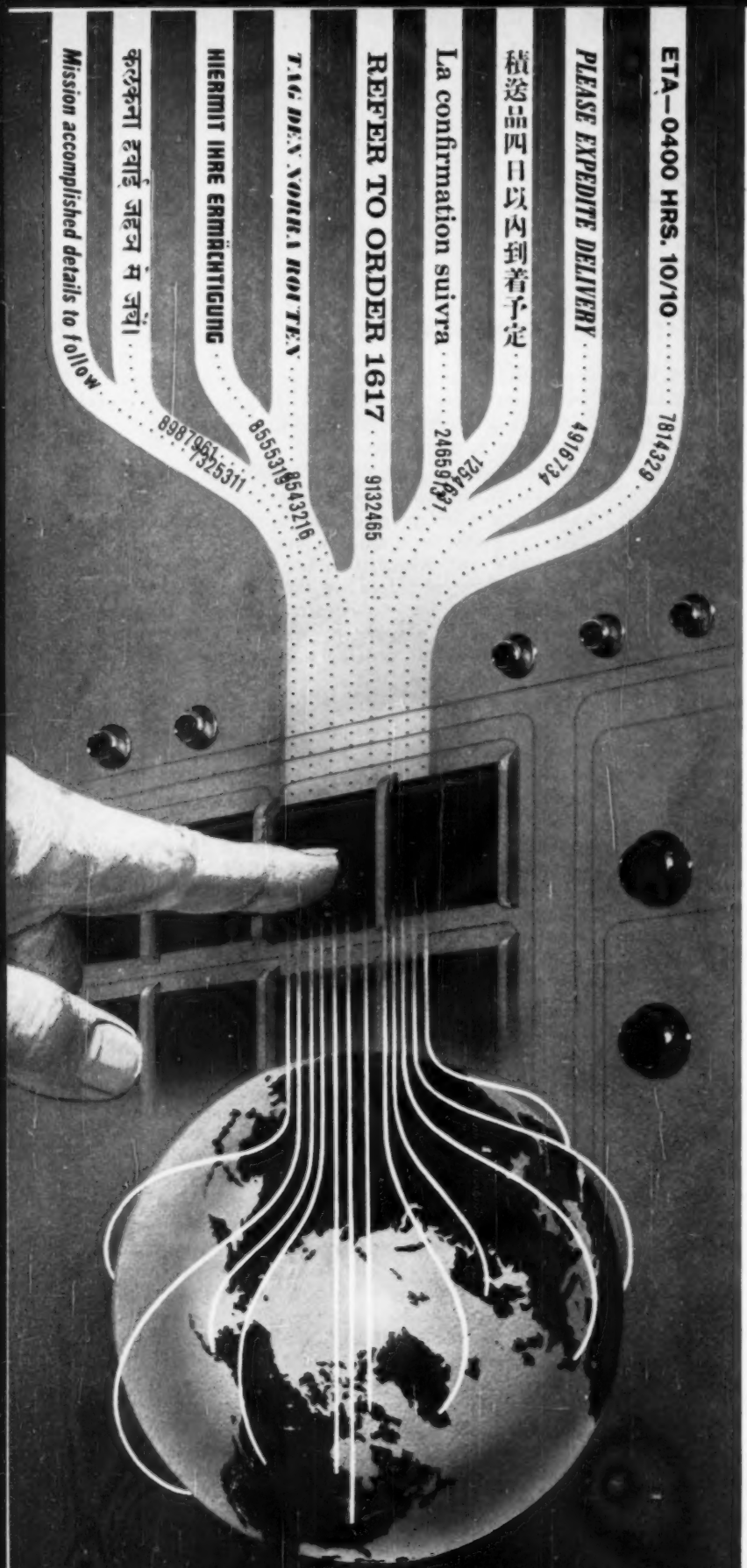
Almost every member of DOD's new first team has assured us in public statements that (1) people are the Pentagon's most valuable resource, and (2) how hard they work is determined to a large extent on how high their morale is. We would have gathered, therefore, that standardizing administrative procedures and personnel regulations—in other words carrying out the intent of the 1958 Reorganization law—would have been one of the first orders of business. Instead we have seen only an occasional glimmer of interest—certainly nothing that could be classed as a concerted effort.

We admit that certain needed changes need Congressional approval, and that Congress, for a lot of reasons—not the least of which is the hunt for votes—likes to plunk its oar into this pond. We believe, however, that one year is enough time to formulate both a legislative proposal and a plan of attack and hope this will be one of the first orders of Congressional business next January.

And Congress is not entirely guilty. Few would disagree that DOD's own personnel policies are not only archaic, but sometimes arbitrary. Among these policies are the frequency of officer rotation in and out of jobs, and the mystical statistics which preclude a man's getting an appointment—even after he has demonstrated conclusively he deserves a boost. A good example of the latter is the fact Admiral Raborn and Navy Secretary Connally had to appeal to the President to get a promotion for Levering Smith, Technical Director of the Fleet Ballistic Missile Program, months and even years after he had earned it.

Other examples of inequitable policies are detailed in the concluding portion of Col. Douglass' article on civilian-military relationships in this issue.

The new defense team has shown great ability to reorganize and unify supply, budget, research and combat organizations. It shouldn't be too great a task for them to devise a system which accords Defense military and civilian personnel equal treatment and opportunities.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Washington Background

What McNamara Expects of You

Secretary of Defense McNamara and Assistant Secretary of Defense Gilpatrick made it clear to AFM editors recently that they expect prompt action and decisions on problems. Both believe too much time is wasted getting advice and coordinating actions.

Neither believes in committee decisions, but believe that the sole function of committees is to exchange ideas. Both believe that most DOD decisions could be made twice as fast as presently. In the words of Deputy Secretary Gilpatrick, the lengthy decision making process is the "greatest single deterrent to a more efficient operation."

Back to School for AF Officers

The recent announcement that the Air Force intends to expand the Air Force Institute of Technology at Wright Field in Dayton, Ohio is only one of many steps the Air Force will take to beef up the schooling of its officers.

Worrying Secretary of the Air Force Zuckert is the fact that, in the missile and electronic age, many Air Force Colonels being considered for general rank have only high school educations.

Super Grades for ISA

In order to come up with definitive answers about what sort of defense the U.S. needs in relation to present world conditions, the Office of the Secretary of Defense for International Security Affairs will be given more super-grade positions to add to their brain-trust.

The Office of Organizational and Management Planning in the General Counsel's Office and ISA are presently at work determining how many new thinkers are needed and where they should fit into the ISA organization.

We Arm, and Plan Disarmament

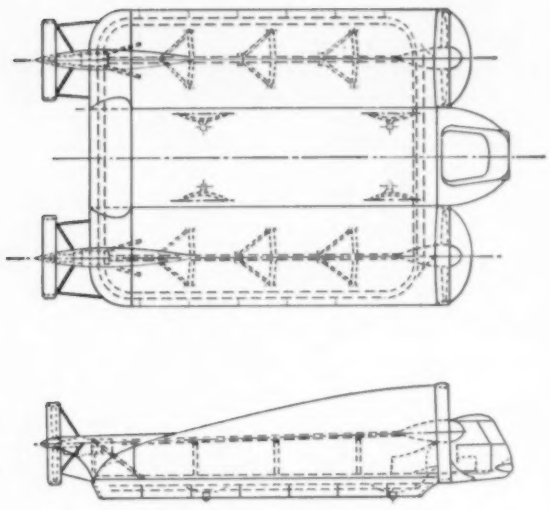
On the chance that the Russians may accept a portion of President Kennedy's disarmament proposals, plans are being formulated on the recesses of the Pentagon on how to implement them. Though no one believes that the Soviets will agree to any significant disarmament proposals, the planning is to insure that the greatest western military power means what it says: that it is sincerely willing to melt down its swords into plowshares.

Disarmament functions within the Pentagon will be supervised by the U.S. Disarmament Agency, formally created by the President late last month. Once this organization is operational, the President can be immediately informed of the importance of any contemplated disarmament, giving him the necessary information to make important decisions in this area. One hoped for result is that the U.S. will be able to call the Russian bluff on disarmament somewhere down the Cold War road.

Army Organization Study

Contrary to previous reports, the Army's Hoelzer Committee is not limited to making recommendations for the reorganization of the Army Technical Services. The committee has the responsibility to review the whole Army organizational structure and to recommend reorganization where needed.

Background: Reorganization of the Army Technical Services, long past due, was one of the first problems to be placed on Secretary of Defense McNamara's now famous list. (See Research Rundown, page 37). Under surveillance of the Office of Organizational and Management Planning in the General Counsel's Office, the Army was asked to come up with recommendations. Since they had to set up a top ranking committee to do the job, the Army decided it might be a good thing to look at the whole Army structure. Results of the study should be made known within a few months.



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The smaller of the two Aeronutronic-designed vehicles will weigh 8,000 pounds, carry a 2½ ton payload, cruise at 40 mph. It will have a range of 100 miles and a grade capability of 30%.

The big machine is a high-speed, heavy duty carrier. Weight: a hefty 44,500 pounds, payload: 22,000 pounds, speed: a fast 80 mph, range: 300 miles. It, too, will have a grade capability of 30%.

In spite of this evidence of accomplishment, Aeronutronic's work in the field has just begun. Army Transportation Command and Navy contracts are speeding further studies into the potentialities of the new vehicle. The ACV is destined to play a significant role in future military and civilian transportation.

Further information regarding the air cushion vehicle, as well as other exciting projects in work at Newport Beach, may be had by writing to Aeronutronic.

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Navigation by sure eye and steady hand

Ferdinand Magellan successfully steered his ships around the world with the aid of an "astronomical ring" . . . one of the navigational wonders of his age. Hung from the steady hand of a sure-eyed seaman, readings were taken by sighting through the rings. Set for the month and day of the week, this ingenious device employed the sun's declination to first determine latitude, then the hour and finally the meridional point of the ship's position.

Today, the "sure eye and steady hand" of Arma's inertial guidance system solves the intricate problems posed by navigating in space . . . keeps space vehicles on course by sensing the most minute changes from programmed speed and direction. And, despite its precise capabilities, the sensing gyro of the guidance system is small enough to be completely encompassed within Magellan's unique brass rings.

Arma, developer of the all inertial Atlas guidance system, airborne fire-control systems, weapons systems for all Navy submarines, and pioneer in space research programs, provides industry and the defense establishment with products and systems of top reliability and value. ARMA, Garden City, New York, a division of American Bosch Arma Corporation . . . the future is our business.

AMERICAN BOSCH ARMA CORPORATION

U.S. Acts to Unite NATO:

Moves to End Duplication of Arms, Waste of Resources

Recognition of West Europe's growing ability to develop and produce modern weapons has forced U.S. planners to accept NATO allies as industrial partners. Joint planning and foreign U.S. purchases are expected to end present wasteful duplication.

Past and present competitions for NATO approval include the U.S. Dart (top left) vs. France's SS-10 (top right); U.S.'s Bullpup, (center), vs. France's AS-30 (bottom).

by C. Paul Means

A SUBTLE yet revolutionary change is occurring in U.S. policy towards the NATO alliance—calculated to member the parts of that disjointed body so that it can respond to the increasing demands of an endless cold war.

The change, disarmingly simple, is to make bilateral and multi-lateral agreements for the purchase of weapons developed by our West European allies solely on the basis of technical and economic considerations, and to encourage alliances between U.S. and European industry.

Augmenting this policy change will be moves to include U.S. military weapon requirements on the NATO Mutual Weapons Development Program's project list, and to remove barriers to the transmission of technical information back and forth across the Atlantic.

The change, more in attitude than in law, evidences this country's belated recognition of the vast research, development and industrial potential of a rehabilitated Western Europe, and our willingness to use that potential. It repudiates our previous tendency to treat our NATO partners like children who need to be armed with "superior" U.S. weapons.

Material benefits to be derived from the change include:

—the eventual elimination of wasteful duplication in weapons system production;

—more coordinated planning by both nations and private industry of NATO's future needs;

—an elimination of what little military aid Europe's principal nations still receive.

The viewpoint that Western Europe could not produce the sophisticated weapons needed for modern military warfare—true for a few years after World War II—lingered too long in the minds of certain U.S. military planners. The resulting emphasis that NATO countries should accept U.S. weapons created friction within the alliance with the rise of European industrial capability, nationalism, and an increasing insistence by European industry that their governments buy a greater share of their armaments at home.

The result has been effusive duplication in many principle areas of weaponry, including rocket boosters, field missiles, fighter aircraft, air transports, and rifles. The worst example was in anti-tank missile development where

Uncooperative Attitudes, Distrust Caused Duplication-- Wasting NATO's Resources

eight Western nations spent well over $100 million to develop 13 similar missiles.

Paralleling the increasing resistance on the part of West European nations to buy U.S. military products has been an increasing willingness to combine their resources for joint developments, and in the spirit of free trade, to purchase each other's weapons.

An important effort to get independent nations with competitive economic interests to coordinate their efforts for a common defense began in 1958 when President Eisenhower appointed the Draper Committee to look into the Military Assistance Program. After examining the morass of red tape ensnarling attempts to make U.S. military needs known to European industry, the committee concluded: "There is more loss of European technical capability than there is gain of security of information."

Early Attempts

The security roadblock to the flow of information had already cost the U.S. millions in wasted time and effort. One example is the Army's attempt to develop an anti-tank weapon. After spending $38 million to develop the Dart, the Army in 1959 accepted the French SS-10 which had been developed by 1952.

Early attempts at exchanging information were derailed in part by U.S. distrust. The contradition between U.S. philosophy and practice was best demonstrated by President Eisenhower, who said in his 1958 State of the Union message:

> **"It is wasteful in the extreme for friendly allies to consume talent and money in solving problems that their friends have already solved—all because of artificial barriers to sharing. We cannot afford to cut ourselves off from the brilliant talents and minds of scientists of friendly countries."**

But at a news conference on February 3, 1960, the President said:

> **"I would not ever give any information, even if the law permitted—that was still in our opinion, withheld from the Soviets themselves. But when the Soviets have the information and know-how to do things, its pretty hard for me to understand why we don't do something with our allies, as long as they themselves stand with us firmly against the probable aggressive intent of communism."**

The Data Exchange Program, instituted by the U.S. has worked well and has provided the U.S. substantial information about European technological developments. The program, however, is only on a government to government basis, and should be liberalized so that more information can flow from company to company and service to service.

There is no reason why an engineer working for a German firm, for example, cannot through the U.S. Embassy be cleared by U.S. security so that he can receive needed information.

The Mutual Weapons Development Program for joint NATO development and production of weapons, has been a great success with only limited U.S. participation.

Projects undertaken so far have been to develop and produce hardware useful only to our allies.

To date the U.S. never requested that MWDP come up with requirements for a system needed not only by NATO but also by the U.S.—intimating that Europe has virtually nothing to contribute to the U.S.

Sometimes our attempts to avoid being helped by our "junior partners" has been ludicrous: NATO officials enthusiastically adopted the Belgium Fabrique National rifle and delivered inspection models to the U.S. Our Army delayed reporting to NATO for months. Finally U.S. officials returned with an American rifle (the M-14) similar to the Belgium weapon.

As European technology improves, the duplication of effort increases. Other examples besides the anti-tank missile competition include: the French developed the CM-170 training plane and the U.S. develops the similar T-37A; The U.S. develops the F-104 fighter and the French develop the competing Mirage III; the U.S. develops Bullpup, the French counter with the AS-30; the U.S.

THE U.S. Sergeant field missile (right) is receiving stiff competition for NATO

develops Thor and Jupiter, the British counter with Blue Streak; the U.S. develops Sergeant, the British compete with Blue Water; the U.S. develops the C-130 while the French and Germans develop the Transall, etc. etc.

Within reason competition is beneficial, and some of the above competitors are different enough to have individual merit, (the C-130 transport can be used for longer hauls while the Transall can be used as a shorter range carrier to and from the battlefield) but the needless variety of weapons produced has wasted time, money, and talent, assets the West cannot afford to squander.

Before the U.S. could make a significant change in policy, many of its top military planners had to recognize the capability and competence of West Europe industry. As late as last Fall many were still expressing anger at the European competition and stressing the superiority of our weapons.

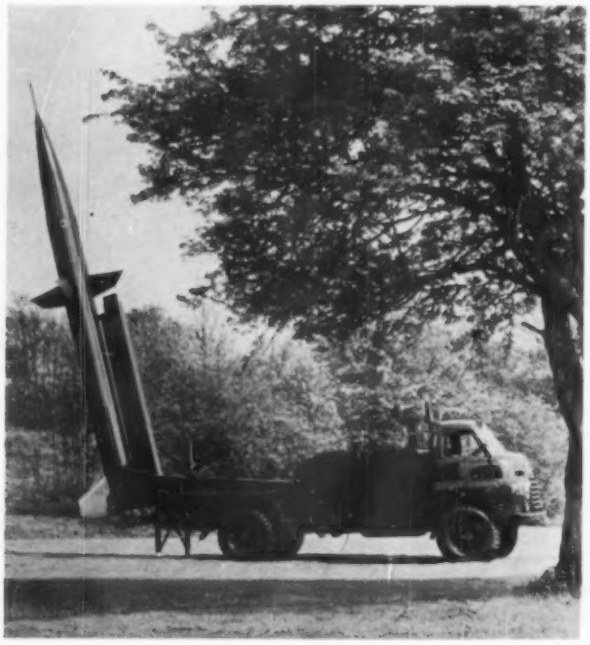
A top DOD planner said last October: "Although our allies may be in a position to contribute significantly in the field of basic research, generally speaking, the United States is further advanced in the field of weaponry. Nevertheless, we are encountering, and will continue to en-

counter, resistance to the acceptance of many of our superior weapons by those nations which have systems under development and have sizeable aircraft, missile and electronics industries pressuring their government to force acceptance of their systems."

Gradual Change

The policy of selling U.S. weapons to Europe but refusing to purchase European weapons was also advocated by dedicated U.S. defense officials on the premise that since the U.S. supports European military procurement through Military Assistance Program we should try to get our money's worth by insuring that Europe buys U.S. military products.

Testimony by Military Assistance Procurement people before Congress reveals, however, that the U.S. now pays for only five percent of the equipment purchased by European NATO armies, and that U.S. military assistance



acceptance from a more recently developed British missile, the Blue Water (left).

to the pjrincipal NATO research, development and industrial powers (England, France and Germany) is virtually nil.

The first indication that the U.S. might change its policy and accept its NATO brothers as full partners was the U.S. Army's participation in the NATO V/STOL project. European NATO officials were impressed that the Army did not merely offer paternally technological aid, but wanted to include their requirements so that the winning design, regardless of which country or group of countries develop it, could be used by the U.S. as well as NATO.

NATO observers are also impressed with the Army's willingness to evaluate the NATO Fiat G-91 as a possible short-term answer to their need for a close support combat aircraft.

The policy change by the U.S. will not immediately eliminate all duplication, nor is the U.S. the only serious offender: (the English, historically an exporter nation, have stubbornly adhered to a go-it-alone philosophy in many areas of weapon development at the expense of a unified program.)

A willingness to buy European weapons and to contract for development of weapons in Europe should be countered with a willingness of the part of European countries to purchase U.S. military wares and the services of U.S. development facilities. U.S. willingness, for example, to buy French developed weapons should be countered with a French willingness to purchase U.S. electronic equipment for its fighters and U.S. manufactured ground support equipment for its missile launching base in the Sahara.

Because of limited production capabilities of some European companies, many weapons developed in Europe and accepted for U.S. military forces will have to be, at least in part, produced in the United States.

U.S. willingness to place its requirements before the NATO Mutual Weapons Development Program staff will eliminate a lot of duplication in the distant future. As the need for new weapons arises, joint determination of what the requirements are and the joint letting of a design contract should virtually eliminate duplicating programs.

No one disputes that the U.S. must go-it-alone on certain weapon developments because of the need to develop weapons that will operate in climates and on terrain different from Europe, but if the U.S. would plan jointly with its NATO allies on weaponry with specific European application much of the duplication will eventually be elimninated.

Formation of alliances between U.S. and foreign industries will do much to unify NATO's weapon development and production effort. Sikorsky's alliance with Sud Aviation and Republic Aircraft's with Fokker are examples of the teams now being formed to vie for NATO-oriented military contracts. These alliances take the form of licensing and royalty agreements, rights to sell each other's products within their native countries, etc.

Information Please!

If a U.S. company joins hands with a French and German company on a weapon development program, chances are they will receive three powerful votes at the NATO MWDP level.

Alliances between companies of different countries also quells local criticism when government military contracts are let abroad. If certain elements in the U.S. complain about a contract being let with X firm in Germany, the German company's U.S. partners bring pressure to show how this helps their business, and U.S. companies with German contracts point out that their business will be in peril if the contract is cancelled.

But the willingness to let contracts abroad, to secure equipment through national agreements, to encourage alliances between foreign and U.S. companies, and to join with our NATO partners in arriving at requirements for new weapons will not solve the problem unless certain barriers to the flow of technical information are not removed.

Not only does U.S. security restrictions hamper cooperative efforts, but also place U.S. industry at a competitive disadvantage in the NATO marketplace: (Britain and Germany have selected AS-30 over the Bullpup. The Bullpup B is probably a superior weapon, but because of security restrictions it cannot be offered for purchase.)

These problems will take the military establishment sometime to solve. From the simple proclamation that we shall integrate with NATO countries in weapons development and buy the best weapons produced will come further changes to put the change in attitude into practice.

Time cannot be wasted. Future weapon systems promise to be so complex, so expensive, and demand so much technological effort that the NATO alliance cannot afford to waste its resources on needless redundancy. ■

NATO's Technical Centers . . .

International Cooperation for the

"Training young engineers in international atmosphere. . ."

"Specialized training in techniques and practices. . ."

Presented is a progress report on NATO's three technical centers, set up to study technical problems through international cooperation . . .

by Fred Hamlin

NOT SO MANY months ago, a rather unusual airplane made its first flight carrying the markings of the Italian Air Force. It looked much the same as a number of other jet fighters, carried comparable armament to most planes of its kind, and had performance ratings that stacked up favorably with similar military aircraft throughout the world.

What was unusual about the plane was that it could have made its maiden flight from a freshly plowed field just about as easily as from a concrete runway. Even more unusual was the plane's hybrid ancestry: The Fiat G-91 sported an Italian airframe, a British powerplant, and to give it a final touch of internationalism, its landing gear was designed by French engineers.

In terms of actual hardware, the Fiat G-91 is indicative of an increasingly profitable trend on the NATO business scene, a trend which is working to the advantage of the United States, its NATO allies, and the overall military preparedness of the free world. Simply, this trend is growing international cooperation to meet a plethora of technical problems—ranging from the best way to find a hostile submarine to the easiest way to knock down enemy aircraft in the event of an attack.

And while it is easiest to point to a completed jet fighter to show the obvious results of this cooperation, perhaps the heaviest long run benefits in this line will come from three international brain trusts—the SACLANT ASW Research Center, the SHAPE Air Defense Technical Center, and the Training Center for Experimental Aerodynamics.

These three organizations are the fairly recent outgrowth of a pair of extremely sound ideas. First, it is patently clear that no single nation has a monopoly on the best available technical ideas in the world. And, second, given the importance of the NATO Alliance, only the best technical support is good enough.

Carrying this logic one step further is E. C. Williams, Director of the SHAPE Air Defense Technical Center (SADTC): "The vulnerability of Europe and of our bases in the area had long been of concern to the United States Air Force, as far back as 1954. Borrowing somewhat from the Lincoln Laboratory concept, the creation of an electronic research organization for SHAPE to study the problem of European Air Defense had been discussed by the Electronics Panel of the Air Force Scientific Advisory Board . . .

"The idea grew that a European

Free World's Technical Problems . . .

"Encourage the practice of experimental work. . ."

"Contribute to the dissemination of knowledge. . ."

laboratory along such lines, internationally staffed, might catalyse action in the several countries and lead towards the greater integration of NATO Air Defense . . ."

Following similar reasoning, the Training Center for Experimental Aerodynamics was set up in 1956, according to Director L. H. G. Sterne, "almost entirely thanks to one man, Professor Theodore von Karman." The three objectives of TCEA were, in Sterne's words, "(1) to give scientists and engineers from the NATO countries a specialized training in the techniques and practices of a modern aerodynamics laboratory; (2) to contribute to the dissemination of knowledge in the field of fluid mechanics, and, more particularly, of experimental and applied aerodynamics; and (3) to encourage the practice of research work in the field of experimental aerodynamics and fluid mechanics."

Newest of the three centers is the SACLANT ASW Center. The statement of this Center's mission is indicative of the job of all three centers: "To provide technical advice and assistance to SACLANT and other NATO commanders and participating nations in the field of antisubmarine warfare, and to be in all respects responsive through SACLANT to the needs of NATO naval forces in this field."

From a management standpoint, the first two centers, SADTC and TCEA, are internationally funded, and the ASW Center is due to become so in the near future. This means, among other things, that the U.S. is getting bargain prices on the work that is coming out of these centers. Thus, the program is anything but a giveaway as far as this country is concerned.

The ASW Center is currently being handled by a non-profit corporation called SIRIMAR, set up through a U.S. university. This, however, doesn't mean that it's a one-way street. Located in La Spezia, Italy, the ASW Center is housed in buildings that have been donated by the Italian government, and its 26 scientists represent nine NATO nations, with the common interest of minimizing the threat of hostile submarines to their security.

TCEA is similarly housed in buildings, and uses equipment donated by the Belgian government in Brussels. The larger part of the cost of operating the facilities is supplied by the U.S., but all participating nations carry their share of the load.

SADTC is located in The Hague, and while it was kicked off with U.S. dollars, it is now funded by several nations. E. C. Williams describes the transfer in these words: "In April 1959, the U.S. government proposed to the Council of the North Atlantic Treaty Organization that the SHAPE Air Defense Technical Center had now matured sufficiently to be handed over to international control and international funding . . . Arrangements were made for the transfer to international control and financing to take effect on 1 July 1960."

The management set up was a committee of National Representatives whose function it would be to survey the scientific work and the effectiveness of that work at the Center. Funding was transferred to the Military Budget Committee of NATO and the normal NATO financial rules were applied. Policy and control of the center went unambiguously to the Supreme Allied Commander Europe, for whom the Center works, and to whom it reports. Appointments to the top jobs in the Center are made by the Supreme Allied Commander.

Changeover to international status was much the same for TCEA, according to its director, L. H. G. Sterne: "For the first three years of its operation, 1956 to 1959, the Center was sponsored jointly by the governments of the U.S. and Belgium. After this initial buildup period, the Permanent Council

of NATO agreed in 1959 to officially recognize the Center as a service to NATO, and that from then on, all the countries expecting to send students to the Center should share in meeting the costs of operation. During the first two years of operation, under this system of multilateral funding, twelve of the fifteen NATO nations have subscribed towards its operating costs."

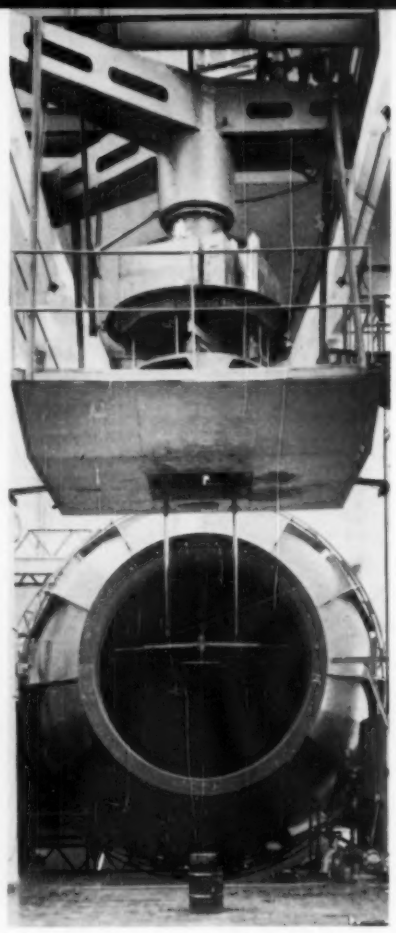
In terms of the challenge its faces, and the amount of work that needs to be done in its area, probably the SACLANT ASW Research Center faces the biggest job of the three in the years to come. Currently its staff numbers 171, and by 1963 (when it will switch over to multilateral funding) it is expected to grow in people and programs to about 35% more than its present size. Now, its 26 scientists are handling applied research in oceanography, sound propagation, submarine detection, and a number of related problems.

For a relatively small operation, its equipment and location are designed for maximum effect. Aside from the actual laboratory buildings, the principal technical facility is the research ship Aragonese, a converted 2000 ton merchant freighter, with shipboard accommodations for about ten scientists. Aragonese is equipped for oceanographic, electronic, and acoustical work at sea, and, conveniently close to La Spezia are Mediterranean testing areas with depths down to 1400 fathoms. Not too far away are the Straits of Gibraltar, the Dardanelles and other areas of considerable military significance.

With these tools, and this talent, the job is to perform operational research and analysis, plus research and limited development, including such activities as monitorship and analysis of oceanographic measurements in the Eastern Atlantic and European waters. Also, the small staff handles some advisory and consultant work for NATO, and exploratory research considered necessary by the technical staff of the Center to achieve NATO objectives delineated by SACLANT, with the aid and advice of the NATO Scientific Council.

One specific comment by Center Scientific Director John Ide is worth noting: "The importance of oceanography has been increasingly recognized in recent years, especially by the more seagoing nations. With two-thirds of the earth's surface covered by the oceans, there are economic, military and scientific objectives to be gained by this increased emphasis.

"Oceanography fits naturally into the program here because of the Center's favorable location in the Mediterranean, and the suitability of the Aragonese for work in this field. The importance to ASW of a better understanding of water currents, sea temperatures, and submarine geophysics in this key area can readily be appreciated."



"For engineers . . . it provides the opportunity to work in up-to-date aerodynamic facilities which just do not exist in these countries. . ."

For an organization with so short a history, and one working in so difficult field, this summing up of accomplishments by Ide is a truly remarkable progress report: "The SACLANT ASW Research Center had been in operation for two years in May of this year. In this period, a laboratory building and an experimental vessel were equipped for ASW research, a scientific staff was selected and organized, and an appropriate technical program was launched upon. Scientists from nine nations, with the assistance of naval personnel from the NATO ASW forces, are now working harmoniously together to solve technical problems important to ASW, and within the capabilities of a research center, unique in its location, facilities and mode of operation."

Equally encouraging is a status report on TCEA, as stated by L. H. G. Sterne: "The value of the Center to the U.S. is naturally different from that to the less-developed members of NATO. For engineers from the latter it provides the opportunity to work in up-to-date aerodynamic facilities which just do not exist in these countries. For the American aerodynamicist it provides the specific professional training which is recognized as necessary in most professions. In the field of experimental aerodynamics this is normally given to the new graduate by his taking a junior post in a research establishment or an aircraft company. This arrangement has, with the growth in complexity of facilities in recent years, become inefficient and expensive.

"A raw graduate sent to work in a large modern wind tunnel can have but the haziest idea of what is going on around him. The test section is shut off from view, the model is seen only on a television screen, and the results appear automatically as holes punched in a stack of cards . . . Thus, the main objective of the Center is to provide the necessary link between the teaching given at a university and the actual requirements of a modern wind tunnel.

"TCEA . . . was in fact an excellent example of enlightened American initiative, designed to help other nations of NATO, but which in the event has proved to be of considerable direct advantage to the U.S. itself in helping to train a few of its better young engineers in a strictly international atmosphere . . ."

Concise and to the point is a wrap-up of the value of SADTC by its director: "The Center has now been operating for a year as the first internationally financed military research establishment within the North Atlantic Treaty Organization, and it seems already that this great experiment in international cooperation, evolved from the funds of the Mutual Weapons Development Program and nurtured by the National Defense Research Organization of The Netherlands is proving a most valuable contribution to the general military well being of the alliance."

If these centers can point with pride to their past achievements, it is well worth bearing in mind that they are all relatively new organizations. Because of this, there can be little doubt that their greatest potential still lies in the future.

That so high a degree of cooperation has been gained through these three NATO technical centers, while at the same time providing a means for real progress on problems bearing on the entire free world, would seem to be the best possible endorsement for the centers, and the most logical reason for their continued success in the future. ■

NATO Forecast

NATO Termed A Mess

In cloistered, heated conferences, NATO experts are snorting more and more of late that the whole NATO operation is becoming a real dog's dinner of chaotic disillusionment. To prevent a complete collapse is going to require the so-far-unexercised strong hand of U.S. leadership.

European complaints were probably best summed up by Brigadier W. F. K. Thompson when he said recently, "the increasing vulnerability of the United States brings into question the circumstances under which she would be willing to 'exchange' New York and Chicago for Moscow and Leningrad.

"Governments are elected to safeguard the national interests of which electorates are apt to take a short-term view. On the one hand, this has underlined the importance of having on this side of the Atlantic a strategic deterrence not subject to an American veto; on the other, it has increased Washington's desire to have control over the use of all nuclear weapons in the event of war.

"This situation cannot be resolved by America asking her allies to trust her. (European nations) economically integrated (through possibly the Western European union) could afford a valid strategic deterrent and their own nuclear armory. Without full American cooperation this would be wasteful of the resources of the alliance. We should, therefore, ask America to trust her allies rather than the other way around."

NATO's Soft Spots

European officials, enmeshed in NATO operations, have been pointing, with startling unanimity of late, to what they term NATO's two major soft spots, areas which are puffy because of lack of U.S. leadership and will harden into intelligent defense only if we start exercising our responsibilities. The soft spots, basically:

1—European nations don't buy, and never intend to, the credibility of the U.S. version of deterrence. It is becoming increasingly obvious to informed observers that we will either invite them onto the team, as we keep saying we are, or they are going to create their own which potentially could result in a kind of "third-forcism." Said one respected European strategist, "if you think things are a mess now, just wait until you let that happen."

2—Potential gains to be achieved by using the European industrial base, through standardization and interdependence, in arms production are in reality being almost totally ignored. "You are making the same mistake we (the British) made just before World War II and the French made just before World War I."

Example: NATO's attempts to get more defense for the buck over the past ten years have had disappointingly meager results. Reason: the U.S., which could put an end to all this mishmash by insisting on sensible divisions of labor between the U.S. and our European allies (thus achieving real economy and a tremendous increase in efficiency), has chosen instead to actually encourage, by forceful participation, what is in fact the basic cause of failure: a refusal to work out some means of leaping the formidable hurdle to solid NATO-team strength. The hurdle: NATO is basically a political and military alliance of commercial rivals.

NORAD ON THE ALERT

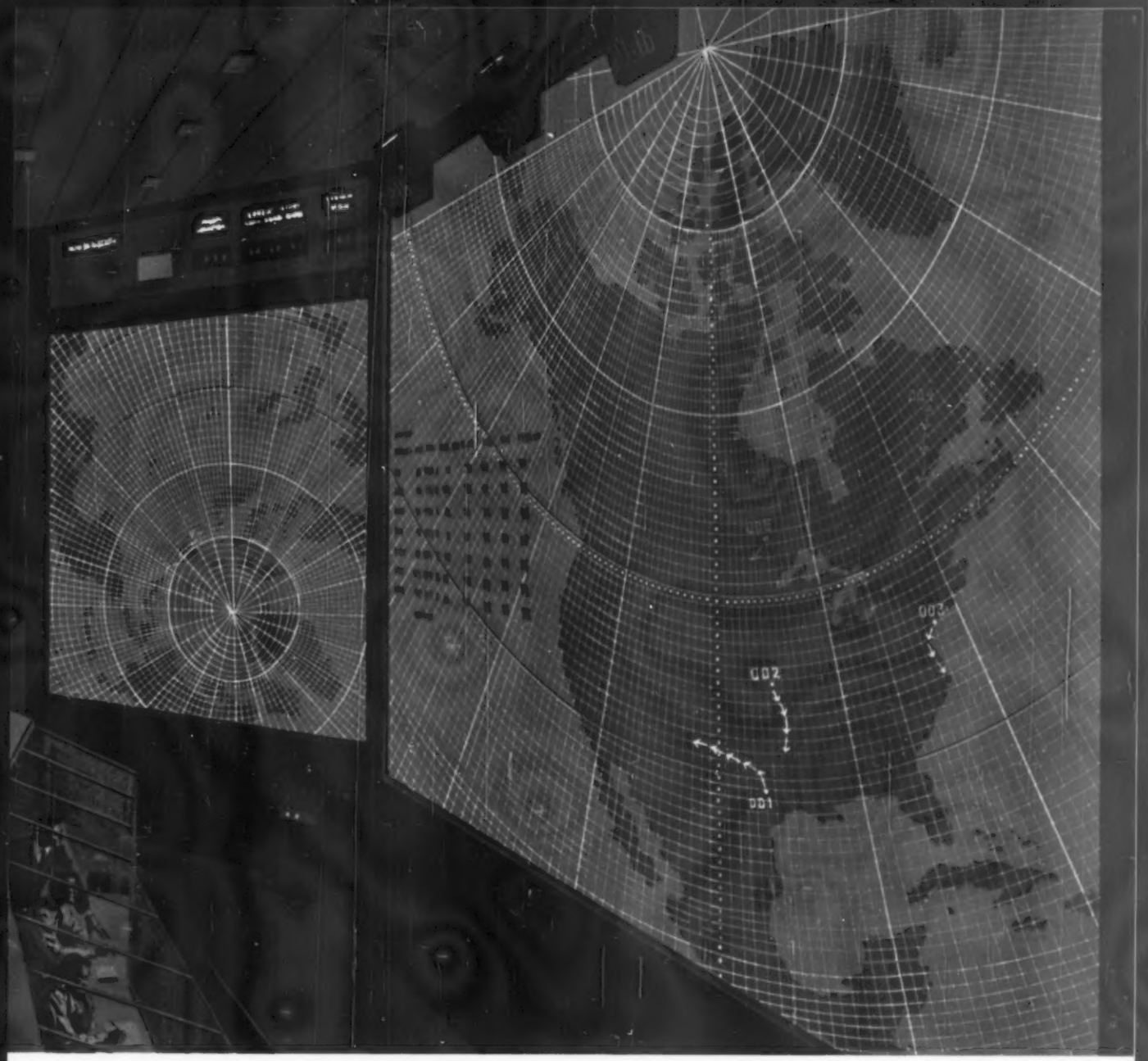
Inputs from BMEWS Provide Instantaneous Missile Data Direct to NORAD Headquarters

From our vast outer defense perimeter, over thousands of miles, to the nerve center of the North American Air Defense Command at Colorado Springs, the most advanced concept of data handling and checkout is being utilized in the BMEWS system. The stakes are high, for the purpose is defense of the North American Continent.

At BMEWS installations operated by USAF Air Defense Command, computers read out missile tracking data from giant radars. This information is simultaneously relayed to NORAD's Combat Operations Center.

The Radio Corporation of America is prime systems contractor for BMEWS. At the COC, RCA's Display Information Processor computing equipment automatically evaluates missile sightings, launch sites and target areas. By means of data processing and projection equipment installed by RCA and a team of other electronics manufacturers, the findings are displayed on huge, two-story high map-screens in coded color symbols, providing the NORAD battle staff with an electronic panorama of the North American and Eurasian land masses.

The handling of BMEWS inputs at NORAD is an example of how RCA data processing capabilities are assuring the high degree of reliability so vital to continental defense.



At NORAD Headquarters, RCA computing equipment, the Display Information Processor (control console shown here) receives sightings data from BMEWS and processes it for automatic readout.

RCA is prime system contractor for the sprawling BMEWS three-site radar network whose probing electronic fingers reach deep into space to provide early warning of missile attacks.

RCA's Automatic Checkout & Monitoring equipment continuously tests and checks performance of portions of the system and alerts an operator when a monitored signal exceeds certain limits.

Out of the defense needs of today a new generation of RCA electronic data processing equipments has been born. For tomorrow's needs RCA offers one of the nation's foremost capabilities in research, design, development and production of data processing equipment for space and missile projects. For information on these and other new RCA scientific developments, write Dept. 434, **Defense Electronic Products,** Radio Corporation of America, Camden, N. J.

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PART II

Military-Civilian Working Relationships-- Sand in the Gears

by Lt. Col. John Jay Douglass
Legal Branch
Army Office of Judge Advocate General

THE SECOND and final portion of an analysis of the problems stemming from military-civilian day-to-day working relationships. Col. Douglass outlines inequities, alleged and real, in pay, rank and/or grade, promotion, fringe benefits, and taxes that cause animosity between the two groups. Though the author foresees no permanent solution until legislation removes some of the inequalities causing friction, he counsels that an alert, conscientious manager can alleviate the situation with a little understanding and sympathy.

To base pay must be added in-grade increases, longevity, allowances, differentials and overtime pay. This complicated pay system for both the military and civilian employees and the non-compatible rating systems (to be discussed later) precludes conflicts directly over pay. This is not to say that salaries are not irritants but are not so constant.

Disagreements over payscales are usually bitter only during the period of the bi-annual pay raise controversy. Since 1946 the Congress has enacted seven pay increases for civilian employees of the government. During this same period the Congress has dabbled with military pay five times. In 1946, 1949, 1955 and 1958 both groups received pay increases. The changes for both groups in 1949 were comprehensive changes of the entire system; otherwise there has been little coordinated rhyme or reason to the legislation or the pattern.

The enactments have ranged from an average 6 per cent increase for military personal in 1958 to a flat $330 in 1948 for civilians. Probably the most irritating aspect of this legislative history, at least to the military, has been the obviousness of the political payoff to the civilian employee whose pay increases of 1955 and 1958 were made retroactive four and five months respectively.

The result of this piecemeal legislation has been to create a crazyquilt of pay patterns. Since 1946 the pay of a GS-1 has increased 134 per cent while that of a Second Lieutenant has increased 37 per cent. On the other hand the pay of a Brigadier General has been increased 97 per cent and that of a GS-15 by 62 per cent.

It is apparent that no effort has been made to coordinate government payscales despite the continued call for an overall study of governmental remuneration. These percentages and figures are made additionally unrealistic by adding longevity, ingrade increases and other allowances which become part of this weird pay pattern.

Confusion is compounded by the difference in pay of civilians serving outside the United States. They may draw differentials, quarters and other real income not available to their own stateside counterparts. Station allowances for the military at certain posts may further create situations making pay comparisons impossible.

Suffice to say the Congress has never really attempted to correlate the money paid to one group with that of another. The variations even include a difference in per diem rates and in the mileage paid to a civilian employee for using his car on official business and that paid for the use of an officer's car on business.

So be it, as far as the economic determination theory and let us turn to other fields. It has become an indication of erudition in recent years to discuss the status motive in individuals as opposed to economics. We can be as erudite as the next one and search for status as a cause for military-civilian employee conflict.

We have all heard many times the statement from a civilian employee that his (or her) rank is equivalent to that of a major (or colonel or perhaps even a general). Never have I heard an officer declare that his rank is the equivalent of a GS-10 or even GS-18.

And Then It Started

Having heard for so long from my civilian associates about their assimilated rank, a little research was made for the document establishing rank and precedence among civil service employees. Strangely, my research did not lead me to a document setting forth rank and precedence, but rather to the Appendix to AR 55-31, 6 June 1956, Transportation and Travel, relating to accommodations to be provided civilian employees aboard vessels. The following chart indicates the accommodation equivalents which should be provided:

General Officers (07-08)
GS 16—GS 18

Majors, Lieutenant Colonels and Colonels (04-05-06)
GS 12—GS 15

Commissioned Officers below Major and Warrant Officers (01-03 and W1-W4)
GS 7—GS 11

Sergeants and other Non-Commissioned Officers (E4-E7)
GS 5—GS 6

Enlisted Men (E1-E3)
GS 1—GS 4

Like an All-American seeing a loose ball, someone snatched this chart and ran (wild). From that point this chart has been used for oh so many, many purposes. It has been used to determine accommodations available for overseas

civilian employees, club privileges, and parking spaces at the Pentagon. Interestingly enough, having found the chart, some were still dissatisfied and upgraded themselves one step or more. The timidity with which this chart has been published has permitted local variations upwards and such adulterated charts may be found in use throughout the services.

An interesting sidelight from this assimilation of rank is that the rank is used always to secure greater privileges apparently, but seldom to secure greater authority or responsibility. When it comes to privileges, RHIP refers to rank as set out in the travel regulations rather than to authority. These grade ratings, of course, placed alongside the crazyquilt pay pattern serve to confuse the total picture. Later on we shall review the fringe benefits which must be added to this complicated structure.

As indicated, this transportation accommodation chart has been used for every conceivable purpose. It has proven handy even if not equitable. Ratings of civilian employees, it is generally believed, have been much inflated in recent years in lieu of pay raises due to dollar inflation. Recently it was announced that the median grade has jumped from GS-4 to GS-6.

These increases have been rationalized as a result of the more complex nature of todays work. But the man who cannot find an employee doing exactly the same job today that he did five years and two ratings ago is not very observant. Too many rewritten job descriptions have provided the promotions.

The relative ranks of military personnel and civilian employees became lost when the promotion system of the two components of our defense agencies are analyzed. Fundamentally, the civilian system is that one has the grade based upon a job and an employee could expect to go to work as a GS-5 or a GS-12 and remain in that rating for 30 years.

Up the Ladder

The military system bases promotion supposedly on the man and fits his rank to the job. An officer may be promoted right out of a position. By the nature of things an officer can only begin at the bottom and progress. It is a question of up or out. Unfortunately, although there is an incompatibility between the two systems, but due to the closeness of the individuals, unofficial attempts are made to apply the principles of one system to the other.

Civilian employees, particularly the more ambitious, feel that they should progress up the ladder because they have lived so long and their military supervisors, failing to understand the civil service system, connive to assist. As indicated, the job description is jimmied or reevaluated to accomplish what the system is not supposed to do.

The military, noting this do-it-yourself method of promotion, then are aggrieved because they too cannot be promoted without the nasty business of competing with their fellows.

The other side of the status coin is of course the question of who bosses who, or is it whom? Recently, a Brigadier General was overheard expostulating (or exploding) loud and long because a service publication presented a picture of a Lieutenant General selected as the *deputy* to a civilian director of a Defense Department agency. This approach that no military officer should be commanded by a civilian is really a status question and ignores the broader picture as to need for stability, executive management, etc.

It must be noted in this connection that the proliferation of civilian supergrades in the Defense Department may compound this situation. In order to justify these grades they must be supervisors—and supervise they will. Senior military positions likewise require Indians, be they civilian or military.

Strange as it may seem, it is in the area of the extras that the greatest possibility and probability for disagreement, ill-feeling, envy or just plain day-to-day irritation may be created. Rank is rank and pay is only money, but the extra emoluments a grateful government has provided for its civil servants or for its boys in uniform lead to smoldering resentments.

The other factors we have analyzed can be definitively measured and though confused and irrational, comparisons can be made. Not so in the never-never land of such disparate factors as medical care, retirement, and social obligations.

At the outset, it may be well to discover the trends in fringe benefits if we may borrow this non-governmental term. One does not have to be more than a casual observer of private industry and labor relations to know that the tax structure as well as other factors has created for both labor and management a multitude of fringe benefits running from on-the-job first aid to hunting lodges in Canada.

Likewise, many forces are joining to improve and increase the fringe benefits of the civil service employees. To the employees it may appear that it is one step forward and two to the rear, but on the whole, the non-monetary benefits accruing to the Government civilian work forces has tended to improve over the past years. What of the boys in khaki (or blue)?

An observer reading the service publications would be convinced that fringe benefits have been reduced to zero. A more objective analysis would indicate that military benefits tend to be cyclical, rising in time of mobilization and reducing in periods of stability. In fact, one might well believe that military fringe benefits are gauged to political necessity and the need to improve the desirability of a military career.

Recent events indicate that benefits are reduced in scope but are seldom eliminated outright. This trend may perhaps be identified with the abortive restrictions on travel of dependents to overseas areas. The travel was not banned but merely limited in application. The military has had similar experiences in the post exchange, commissary and medicare fields.

Other Benefits

In certain fields, no comparison of benefits is possible as the benefit is one known only to military and their dependents or only to the civilian employee. Actually, in almost all areas, the type and nature of the benefits and their implementations are so dissimilar as to prohibit objective comparison. In the forefront of the red flags waved in the faces of civilian employees are the exchanges and commissaries which may be patronized only by military personnel.

Even more irritating is the fact that the prohibitions are enforced (largely to prevent the attack on this privilege by local retail merchants). This one-sided benefit applies only in the United States. Overseas, civilians and military alike crowd the exchanges and commissaries.

These military retail stores have historical beginnings and have been continued based on the "isolation" of the military community. As civilian employees are almost entirely integrated in the local community, there is considered to be no need for them to utilize these facilities. Significantly, a more rational basis for continuing the post exchanges has been the production of welfare and recreation funds from the profits.

Thus, in effect military personnel pay for many of their own benefits. The exchanges are analagous to restaurant services or cafeterias provided on most installations open to all and in many cases designed specifically for the use of civilian employees. Where the population is made up largely of civilian employees, the profits of such facilities are, like PX profits, funnelled into worker benefit funds, both military and civilian.

The field of social life presents a more complex problem to the com-

How to turn a new face into an old hand

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Today at Hughes these levels of improvement have become the norm in manufacturing. New employees who don't know a transistor from a thimble become skilled assemblers in days instead of weeks. They start almost immediately to help build some of the most complex electronic systems ever developed.

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Videosonic systems have proven their merit in 5 years of use in Hughes plants in El Segundo and Fullerton, California and Tucson, Arizona. Today, they assure the reliability and speed production of Polaris missiles, electronic armament systems, Falcon missiles, electronic air defense control systems, and advanced computer systems.

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mander insofar as it involves the relation of military and civilian employees. By custom and tradition, each post has an officer's club which may or may not be the center of the officer's social life. Ostensibly these clubs or messes are self-sustaining so it may be a misnomer to call the club a fringe benefit. This is not the whole truth, however, for by their nature as a government instrumentality and the benefits arising therefrom the club may be classed as a fringe benefit.

On the other hand, the civilian employee has the idea that the officers (and NCO's) have a free country club provided at the expense of the taxpayer (a view widely held by civilians in and out of government). The dues-paying officer, to the contrary, is convinced that his dues are excessive, the prices too high and generally, that this advantage is overrated. This subject of officer's clubs may be viewed quite differently by different employees depending upon their own status in the civilian caste system.

Where officer's clubs are not crowded and receipts are suffering, arrangements are often made for the higher classified employees to become associate members of the club. In addition, many retired reservists now employed by the government are entitled to associate memberships.

Certainly the most misunderstood and most abused of the military benefits are those relating to taxes, both federal and state. The average taxpayer, burdened by taxes of all sorts somehow has the idea that military personnel are exempt from federal income taxes.

It is in the sphere of state taxation that the civilian employee becomes most exasperated and possibly with some justification. The aggravation is due to the constant complaining by military personnel about paying state taxes in a state not of their choosing. The Soldiers and Sailors Civil Relief Act with the judicial decisions implementing the act has served to insulate members of the Armed Forces from many of the incidents of state taxation.

Let it be noted that not every military person evades such taxes, but the practice is widespread. The advantages of avoiding the personal property tax are of little importance for avoidance of personal property tax is a game played well by all tax payers. Service personnel avoid the sales tax only to the extent purchases are made at post exchanges and commissaries.

One of the most oppressive state taxes under the present tax structure is the real property tax. This is paid by military personnel other than those who live in government quarters, whether it is paid as rent or by virtue of home ownership. The military do pay the gasoline taxes, alcohol taxes, excise taxes and all the hidden taxes.

In all fairness on this question of tax avoidance, it should be pointed out that many of the services provided to the citizens of a state may be denied the military as they are part of the mobile citizenry of America. Most discouraging is the effective practical denial of suffrage to military personnel. This is due not only to the time and residence requirements applicable to all of the mobile population of America, but the most stringent restrictions on soldier voting generally.

To further belabor the point would serve no useful purpose. The rapid reader must by now be convinced that blood flows down the corridors of every military headquarters. Do not be misled for this is not so. Even the occasional marriage of the combatants does not transfer the bloodshed to the home.

No Solution Offered

Actually all would agree that the relationships are remarkably free of open rancor. On the other hand, all would agree that these points of irritation and disagreement exist. Any observer of the military-civilian scene can add to these examples pages of incidents to illustrate these points. A really astute observer can no doubt add further areas of difficulty.

All too often this problem is well known and discussed but seldom is there an analysis of the problem. Specific areas such as those reviewed herein are made the subject of endless conversation and may even be subject to formal study and cogitation. Unfortunately the significance of a particular irritant may vary from office to office or from post to post—even from individual to individual.

No simple solution is offered. Certainly mass marriage is not feasible, which as indicated is one solution. Quite frankly, there may be no overall school solution to the tension between the two groups. Nonetheless an observant commander, supervisor or manager can sense the trend and the problem in his own office or plant and try to apply remedial first aid. He may, if he is clever enough, root out the problem almost entirely.

It is doubtful that a complete job can ever be accomplished so long as so much of the causal condition is statutory. All that has been sought is to present the problem. An effective boss will apply some grease rather than sand realizing that it is meshing of the military and civilian gears which makes our defense mechanism run each day. ■

On Weapons Systems . . .

Can Management Control Reliability?

One company providing weapons systems for defense has proven that management can control reliability. Here is what they found . . .

by
A. C. McMaster and J. Y. Mc Clure
General Dynamics Corp.

"Weapons systems have spiraled the advancement of technology."

DURING THE PAST DECADE military weaponry has spiraled the advancement of technology. Frontiers have been swept farther back by such programs as Vanguard, Explorer, Atlas, Polaris, Hustler, Terrier and Mauler.

With this technological explosion, the issue of reliability has been thrust to the foreground. This issue has been magnified by the complexity of the military task and must be controlled by management.

General Dynamics, in contributing to some of the country's major weapon systems, has solved many reliability problems. Accordingly, it may be worthwhile to examine some of these experiences in programs such as the B-58 Hustlers, Atlas and Terrier. *(See table.)*

As one might expect, these are but a few of the reliability problems encountered in complex systems during their development and production. In order to grasp the impact of reliability on management, it is well to understand in more detail at least two of the experiences listed in the Table.

For instance, the B-58 search radar assists in the accurate navigation of the aircraft to its target. A significant malfunction of the search radar magnetron, however, could make the system useless.

During early production the failure rate of the magnetron was too high. Although the predicted mean-time between malfunctions was 125 hours, the mean-time in production tests was only 32 hours.

The Joint Approach

As a result, a special joint industry-Air Force committee, including management reliability representatives of each weapon system team member affected, met periodically to resolve the problem. The changes effected included redesign of the magnetron, redesign of the search radar modulator power supply, and revised procedural and support specifications.

As these changes were introduced, reliability of the magnetron steadily increased from 32 hours to 177 hours between malfunctions, a significant reliability improvement.

Early in the Terrier program Navy and General Dynamics had recognized that reliability was an essential attribute of guided missiles. It also was recognized that certain special efforts would be required to assure that reliability could be achieved reasonably.

Among the efforts aimed at controlling reliability was a hardware assessment testing program of items

being manufactured during early production phases.

During this assessment it was discovered that the altitude sensing instruments were subject to erratic output caused by leaky aneroid bellows. This represented a serious reliability shortcoming for the Terrier weapon system which requires that the missile be able to detect its own speed and altitude throughout flight so that maneuverability information can be provided to its control system.

The First Step

The basic cause of the defective units was traced to a faulty manufacturing process in the pressure bellows assembly. Action was taken to change the process to ensure a more reliable instrument. Units in process and those delivered were recycled through the point of original manufacture for correction.

This and other examples confirmed to management that the need for an awareness of potential unreliability is essential. Earlier and more thorough assessment points were established. A closer study of reliability techniques and milestones was initiated. Greater emphasis was placed on the need to exercise control of the manufacturing process at its lowest practical point.

Suppliers in particular were brought into sharper focus as potential-sources of difficulty. Management's attitude and cognizance became more conscious of the responsibility it has in controlling the reliability of a complex product.

As a result, a series of positive steps was taken to meet the reliability challenge.

The first step was the organization of skills and methods to optimize distinct controls. For example, at the Fort Worth Division (B-58) a separate Reliability department was organized to guarantee that the necessary controls and methods were implemented in each line department.

The Second Step

In the Astronautics Division (Atlas) the Reliability section of Engineering was combined with Quality Control to form the Reliability Control Department, reporting directly to the Division president.

At the Pomona Division (Terrier) Reliability groups were formed in the Engineering and Quality Control Departments.

The output of the organizations has been and is expected to continue to put reliability, as an effort, and as a parameter, on a rational orderly plane from which sound management decisions can be made. Many of the controls actually have been placed in the hands of the reliability groups.

For instance, requirements for designers to follow, standards to be used, test programs to be instituted and reliability bogeys to be met have become the responsibility of the reliability function. Thus requirements are set by reliability personnel and then monitored to determine that they are met or reasonably changed to meet with decisions deemed essential by management. It is important to note that the controls are established and can be altered only by intention.

The second step to meet the reliability challenge was the acquisition and/or training of personnel to match the need for knowledge about reliability as a parameter to be considered in the design and manufacture of complex items.

It was recognized that only through the orderly application of reliability knowledge could wise decisions be reached in the balance of reliability, cost and value. Skills necessary to understand the responsibility and yet be capable of solving the technical problems were recognized as essential in meeting the total reliability challenge.

Men with vision and a technical understanding of these things essential to achieving reliability were brought into responsible positions.

The third step was creation of a corporate-wide management advisory panel by Earl D. Johnson, President of General Dynamics Corporation. In his announcement of the General Dynamics Panel on Reliability, he stated:

"Reliability is an essential quality of the products of General Dynamics. It is a quality fully as important as performance; in fact, it is a vital element of performance.

"Our customers, particularly the Armed Services, demand reliability with increasing emphasis and they are entitled to it."

The panel has provided a focal point for reliability information and advice on techniques and skills to the management. It is composed of technical and executive personnel whose level within the corporation makes important decisions.

Management can control reliability and can properly balance it with cost if certain factors are present. In essence, management must be aware that reliability is a parameter of products being produced; management's frame of mind must be receptive to a special effort for controlling reliability.

Further, reliability must be someone's particular business. Controls and finite actions aimed at reliability must be consciously established through direct effort on the part of skilled organization and people.

Management can control reliability. With the factors mentioned, reliability can be achieved; without them it remains subject to chance. ■

Table of ills, diagnoses, cures . . .

	SYMPTOMS	DEFINITION	SOLUTION	FUTURE CORR. ACTION
B-58	1. TAKE OFF ABORTED.	ENGINE CONTROL ALTERNATOR FAILURE.	SHAFT AND BEARINGS REDESIGNED.	EARLIER ASSESSMENT OF PRODUCTS.
	2. SEARCH RADAR STOPS TRANSMITTING.	TUNEABLE MAGNETRON SYSTEM FAILS.	PRODUCT REDESIGN.	HARDWARE CHANGED.
ATLAS	1. FUEL LEAK AT BOOSTER STAGING.	WELD DEFECTS—TIE RODS SHEARED CAUSING ASSEMBLY MISALIGNMENT.	REDESIGNED TIE RODS—X-RAY ACCEPTANCE REQUIRED.	RELIABILITY BULLETIN ISSUED ADVISING DESIGNER OF PROBLEM TYPE.
	2. MISSILE UNSTABLE IN FLIGHT.	PITCH DISPLACEMENT GYRO MOTOR FAILED PRIOR TO LAUNCH.	COUNTDOWN PROCEDURE REVISED. GYRO SPIN MOTOR DETECTION CIRCUIT ADDED.	
TERRIER	1. MISSILE AND BOOSTER FAIL TO SEPARATE.	THRUST MISALIGNMENT BOOSTER PARTS OF PROPELLANT PROTECTIVE PLUG NOT BEING BLOWN FREE OF NOZZLE.	REDESIGNED BOND OF PLUG TO NOZZLE.	MORE COMPLETE DESIGN ANALYSIS AND DESIGN ASSESSMENT.
	2. MISSILE INCAPABLE OF RESPONDING TO ALTITUDE CHANGES.	PRESSURE BELLOWS LEAK.	REWORK ASSEMBLIES. CHANGE MANUFACTURING PROCESS.	MORE CAREFUL ATTENTION TO PRODUCTS FROM SUPPLIERS. MORE COMPLETE DEFINITION OF REQUIREMENTS.

Westinghouse Electric Power Systems

Electric power is the lifeblood of flight vehicles.

Instrumentation, control, guidance and navigation, communication, human comfort—indeed virtually every function in every modern transport, military or civil aircraft, missile or space vehicle depends on an electric power system.

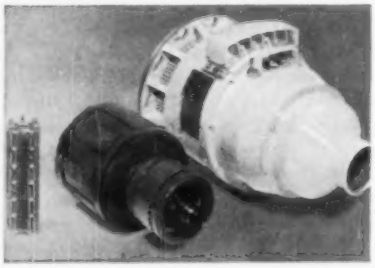
For many years Westinghouse has specialized in the design and production of such systems. These have ranged from wind-powered generators of World War I aircraft to today's superb brushless generators and static control equipment.

Headquarters for this important activity is the Westinghouse Aerospace Electrical Department at Lima, Ohio.

Here more than 1600 skilled men and women design, develop and produce airborne electrical equipment which has achieved an unrivaled record of trouble free service.

Here, too, skilled scientists and engineers are working on new systems to meet electrical requirements of flight in years to come. This work is directed by R. W. Esarey, AED manager (left seated), A. L. Paquette, marketing manager (seated), J. D. Miner, engineering manager, and F. W. Lowry (right standing), manager of advanced systems applications.

One of the most successful flight proved electric power systems ever built consists of 30 and 40 KVA brushless generators and static control apparatus for the Boeing commercial Jetliners. Mean time between removals is in thousands of hours — a dependability record many times better than that of ordinary brush-type generators.



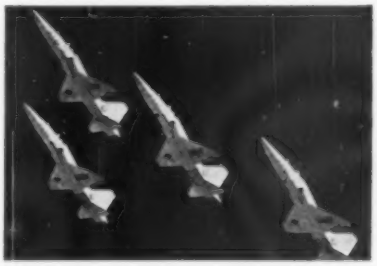
Longer service life and greater reliability results from the elimination of commutators, carbon brushes, and collector rings. These are replaced by a single rectifier stack consisting of high-temperature silicon diodes. Westinghouse research in semiconductors made this important advance possible. Results: greater reliability, increased TBO, reduced maintenance costs.

Serve the Advancing Needs of Flight

Westinghouse brushless generators are standard on Boeing 707s and 720s. The coming 3-engine Boeing 727, above, will have a new Westinghouse starter-generator system using the basic, time-proved brushless design.

The largest rated brushless air-cooled generators ever produced supply electric power for the Air Force B-52H, built by Boeing. These Westinghouse generators are rated at 120 KVA.

Oil-cooled brushless generators are provided for two major high-performance military aircraft, the Air Force B-58 "Hustler," built by Convair, and the Navy A3J, built by North American Aviation.



Another military aircraft, the sleek Air Force T-38 Jet Trainer, built by Northrop, is equipped with Westinghouse 8 KVA brushless generators.

Space electric power systems also are a major activity at Westinghouse. The Air Force manned space glider, Dyna-Soar, to be built by Boeing, will have a new brushless generator and static control equipment to supply vital electric power.

For the future, thermoelectric, thermionic, solar cells of high efficiency, magnetohydrodynamic and other advanced systems are being developed to provide electric power for space as well as non-space applications.

You can be sure . . . if it's

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Technical Staffs . . .

Are They Losing

SCIENTIFIC ADVISERS to the military have a long history. Perhaps the first one on record was the Greek scientist whose knowledge enabled the defense forces of Syracuse to set fire to an attacking fleet of Roman galleys with mirrors.

In modern times, Napoleon employed skilled civilian ballisticians and metallurgists.

However, such civilian experts have been generally retained to solve specific, existing equipment problems. Anticipation of the impact of technology on tactics and logistics was properly and exclusively part of a line officer's qualifications.

In the military history of the United States, it has been customary to terminate expensive civilian advice after an emergency has passed.

This has been a costly economy, as early World War II mistakes proved. Incorrect evaluation of the potential of military aircraft, the battleship-carrier problem, and the incorrect placement of guns on the early B-17's are cases in point.

One of the earliest effective civilian technical staffs was originated when aerial gunnery film disclosed that gunners were intuitively leading fighters in the wrong direction. That civilian group improved gunnery, and also, through the use of primitive operations research, developed effective submarine research patterns.

Financed by wartime appropriations and motivated by wartime patriotism, the group functioned well until the end of the war and then collapsed.

Other WW II groups were also very effective. Built around physicists, these groups contained statisticians, chemists, applied mathematicians, and electrical engineers. Such technical staffs developed powerful techniques—game theory and operations research, for example. Computational procedures were revolutionized by the origination of large computers.

By the end of World War II, the civilian technical staff in the military environment was firmly established as an extremely gifted, sometimes useful, somewhat glamorous, and altogether incomprehensible collection of egg heads!

With the Korean War, the picture of the technical staff became chaotic.

And this is still the situation today.

There are many factors which help to make the situation as it is.

For instance, large airframe companies, with a kindly eye to subsidized overhead, have filled barns with mediocre talent and called them "operations research" groups, or perhaps "advanced planning" staffs.

Three Directions

Fortunately, most of these groups died. Other staffs, having no purpose, generated one.

To equalize prestige, some companies have given every salaried employee the title "Member of the Technical Staff."

Generally speaking, these fruitless staffs have taken one of three major directions.

Some groups justified their employers' products by "proving" through shiny covered studies and objective evaluation that the existing product is the best of all possible products. Hall marks of this *ex post facto* fundamental research are qualitative statistics and a love for coined words.

A second staff purpose seems to have been the generation of proposals which, by virtue of the staff's existence, assure the quality of the proposed product or study. (In all fairness, this activity does allow release from the debilitating straight jacket of truth in which the scientist is bound!)

The third escape for staff groups is technical politics. Such groups retain only the name "staff" and exhibit intense paranoiac behavior when reminded of the existence of honest scientific endeavor.

Obviously, staff groups like the ones described are a military liability. This is not surprising since military administration has probably never really analyzed the proper and potential functions of scientific technical staffs.

What, then, is an ideal technical staff?

Ideally, a technical staff supporting the military is good if it anticipates all technical questions which the military should ask and answers them.

Actually, a good staff can anticipate most such questions, and answer part of them. It is natural that a staff can perform this function, because technical questions inevitably follow the application of new technology to military needs, and members of a good staff are familiar with this technology.

A good technical staff communicates in clear and timely fashion with the single intent to maximize the capabilities of the military forces.

A technical staff should in no way

by Dr. Buchanan Cargal
Dr. Lura C. Dean
Dynalectron Corporation

Cargal

Dean

Their Military Prestige?

A breakdown in communications between technical staffs and administration stands to place the scientific advisors in the position of military liabilities . . .

compete with the military nor preempt military prerogatives.

Finally, a good staff acts as an honest and discreet evaluator of military action.

While the organizational structure of a technical staff is of some importance, it is invariably over-emphasized. A staff is good if its members are good. A staff is bad if its members are bad. Good members attract more good members. The way to build a good technical staff is to obtain one really competent man and give him the task of generating a staff.

What It Takes

The problem, then, resolves to finding one man. In the writers opinion, this man should be a mathematician or theoretical physicist who enjoys a good reputation for technical excellence among established members of his own profession. There is no need to catalog personality requirements—books on management are full of them. But the requirement for scientific stature among his peers cannot be qualified. Given funds and facilities, this one man can assemble a staff.

When the staff is organized, its internal workings should be left to its chief. The only action which the military agency need to take to maintain an increasingly effective staff is to assure continuity and to act as a buffer between the staff and external political and administrative maneuvers.

This is not a small point. Politics and administration are actively and viciously antithetical to scientific research. The occasional intrusion of administration will halve a staff's effectiveness. The regular intrusion of politics will kill it completely.

A qualified scientist, retained to generate a technical staff, would certainly insist upon the following working conditions:

(1) *Freedom of inquiry and problem selection.* Good research is undirected. It is recognized that a staff is maintained to support an effort. Certainly the staff is aware of this ultimate reason for its support. However, if a scientist is originally bought because of his supposed cleverness in attacking problems, it is elementary that his attack may appear incongruous to the directors of the activity which he supports.

(2) *Utility.* Any organization is frustrated when the results of its work are ignored or shunted into an unsympathetic structure. The inventions and recommendations of a staff should be considered by individuals who have the authority to either reject or act on them. Organizationally, this requires that a staff be directly responsible at a high level.

(3) *Adequate staff facilities.* To be effective, a research scientist needs a private office—the easy ability to isolate himself from uninterrupted hours of concentration. The chief of the staff, who would certainly insist on research activity, should have an administrative assistant to handle details of supply, work request, etc. Some clerical help and technical typists should be internally part of the organization.

(4) *Recognition.* The scientist seeks recognition through publication of his discoveries. Such publication should be encouraged.

(5) *Remuneration.* In industrial areas such as Southern California, a staff will not survive when higher salaries and good conditions are to be had elsewhere in the immediate vicinity.

(6) *Attendance at professional meetings.* Attending professional meetings in the scientist's specialty should be considered not as a privilege awarded by administration but as a requirement for continued technical excellence which is the scientist's obligation.

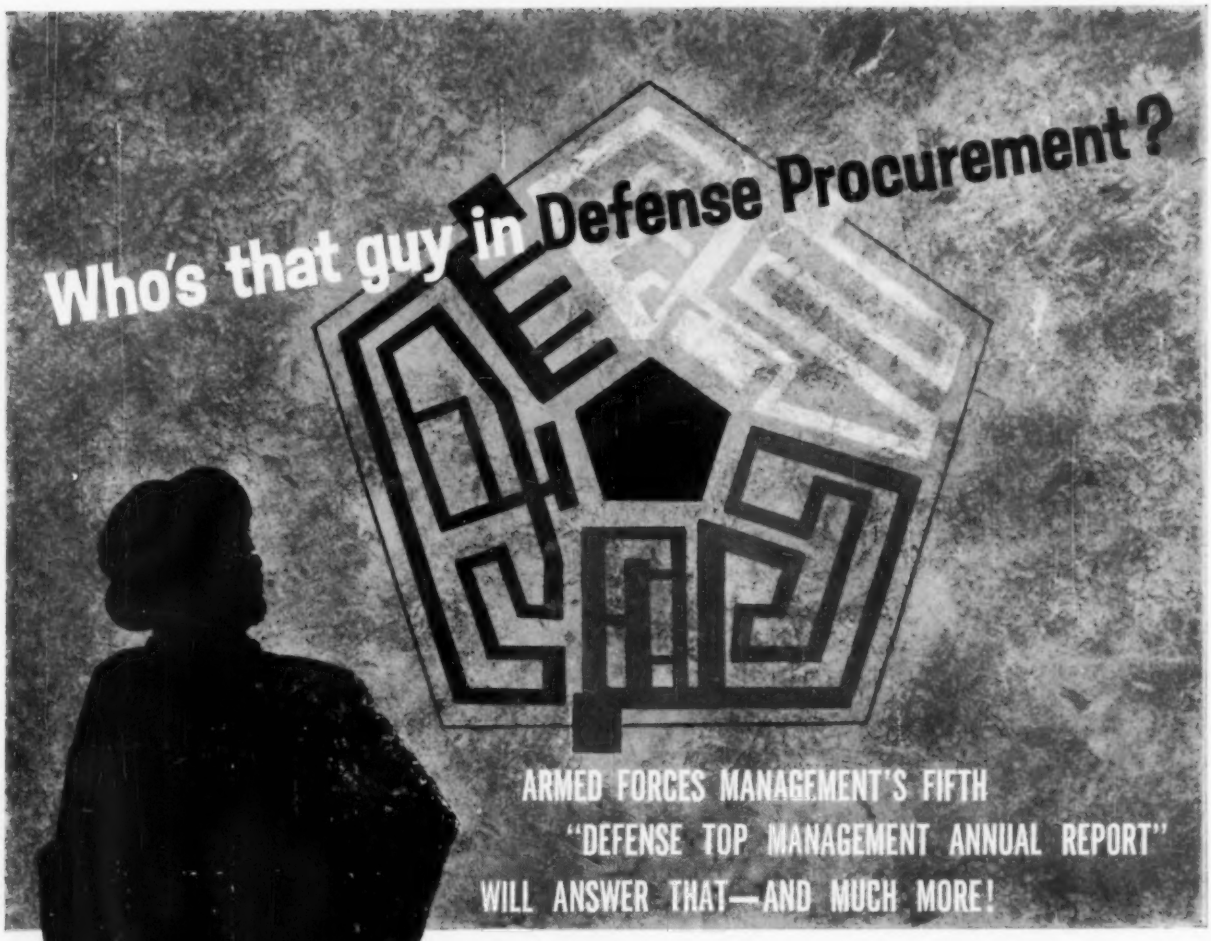
(7) *Adequate technical library.* A requisite for fruitful work.

(8) *Internal communication.* Instruction and seminary activity are natural scientific activities and should be expected.

Looking Ahead

It is clear that the Navy, at least, is cognizant of the value of research staff activities. The excellent school at Monterrey is equipping officers to evaluate and generate research which is pertinent to complex military systems. A civilian research staff could be most effective when used to augment the capabilities of these officers. In the long view, this seems certain to occur. The present difficulties with civilian staff utilization appear to be transitory, and the Navy can expect the future to produce harmonious fruitful activity.

However, at the present time, all too few (if indeed any) military installations and organizations recognize the importance of these requisites for effective technical staff work. The current chaos will prevail until they do. ■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Research Rundown

Army Tech Services in for Reorganization

The unwieldy Army Research and Development establishment will be overhauled in the near future. The blue print for the long-due streamlining is being worked on by the Army presently under surveillance of the Office of Organizational and Management Planning in the DOD General Counsel's Office. The new organization will correspond more closely to the Air Force and Navy formats.

New Advances in EDP Announced

It has been as obvious as sunrise that a technological revolution—easily as dynamic as anything in the missile business—has been building up for the past five years into what top Defense executives (who are leading the surge) sometimes call the "management tools" business.

In late September, two firms announced the passing of a couple more milestones which can have a significant impact on the way Defense handles its paperwork. The highlights:

Burroughs Corp.—jumped into the punched card electronic computer business, the largest single bloc in the billion-dollar-a-year automatic data processing market.

Punched cards are nothing new, but what is new about the Burroughs B200 series (which can handle IBM cards) is what Burroughs president Ray Eppert calls its "maximum through put." Part of the translation: data processing is handled with virtually no, or precious little, human intervention after the cards make their initial start through the system. And as Defense officials know, human error has become the toughest headache in the whole routine.

Philco Corp.—in another attack on human foibles in data processing, Philco revealed it has an $800,000 plus contract with the Post Office Department to develop a practical piece of hardware that reads and recognizes the addresses on envelopes.

Says Philco vice president, Henry Argento, "we've already solved all the basic problems. The Post Office contract merely represents an engineering effort to work out the specific application problems."

Philco has also made a proposal to the Army Finance Center for one of the scanners to read checks. Scanner uses a high resolution TV tube, and because of its other electrical and electro-mechanical characteristics, has potentially a wide variety of military applications.

Examples: inventory, personnel records, requisition forms control, reading and even abstracting documents (if tied to a computer) and beyond that, with micro miniaturization, photo reconnaissance and scanning radar screens.

Reportedly, other military groups have already investigated some of the possibilities of replacing the human eye with an electrical one (particularly for routine chores) and are "extremely interested in the scanner."

Jet Engines for Ships?

The Navy is studying present use of jet engines to power turbines on gas transmission lines. If the engines prove durable, they may prove to be favored over nuclear engines to power large surface ships. First use will be in hydrofoil craft.

Navy R&D To Be PERTized?

The Bureau of Weapons is "seriously considering" PERTing the whole Navy Anti-Submarine Warfare effort. Idea is to streamline the communications channel between Navy and industry in this vital area. (See April AFM).

by LCDR M. M. ANGAS, USN

Navy Leadership Training:

Poor Methods Yield Mixed Results

LCDR Angas' article has proven to be most controversial even before publication. The Navy recommended it not be published, and that "some paragraphs . . . if quoted elsewhere out of context would embarrass the Navy." The objections were that "the author makes gratuitous assumptions throughout stating as factual, things that are evidently not true . . . Her assumption that the guided discussion and role-playing techniques do not bring about personal involvement, self-understanding, and improvement is just not true." Answers author Angas: "I think my article will stimulate thoughtful discussion as to possible methods for improvement . . ."

NEW METHODS HAVE been developed for training in the field of human relations. These methods are of importance to a military officer's knowledge of training for leadership. Knowledge of methods and theory of the process are of use to those engaged in developing the capacities for leadership among their subordinates.

Most military officers think of themselves as good leaders. Self-failures in leadership situations are usually explained by, and attributed to, external factors, pressure of work, or the refusal of the person who is being led to follow. Consequently, failures in leadership due to personal failure on the part of the leader are examined in terms of others' failures, not in self-examination. For, people quite quickly perceive the limitations of others in leadership situations. These limitations, because they are so obvious, lead to the presumption that people should be able to be taught how to be leaders.

Yet, what is leadership in today's military? Is there a method by which leadership skills may be developed in an academic setting? Before answers are attempted to these questions, let us first consider two of the current and most popular explanations of what is leadership and how it may be created.

One point of view describes leadership as a sort of mysterious force cooped up within the personality. To this force are subscribed many abstract qualities such as courage, sincerity, loyalty, integrity, tact, industriousness, etc. If these qualities are nurtured and the characteristics of peevishness, triviality, self-indulgence, irresponsibility, indolence, etc., are cast out, the force of leadership will be released. By combining this force with an understanding of human behavior and the application of human relations techniques, a person will be a leader. Interwoven into this theme is the requirement to know your job.

This concept of leadership ignores just what these abstract qualities are. Honesty, courage, and industriousness are not the private possessions of an individual. They are working adaptations of personal capacities within a defined environment. They may not always be used to good purpose in an environment which rejects these capacities. Use of them would only lead to frustration and conflict between junior and senior to the detriment of the accomplishment of the mission.

False Motives

For example, a senior who is honest, courageous, sincere, and hard-working may have a junior who cannot accept the validity of such personal capacities. Nothing in the junior's previous experience has taught him how to respond to such capacities. No matter how much the junior is encouraged by the senior to express himself freely, to be honestly critical, to make decisions, the junior will withdraw from such responsibility and refuse to commit himself. In order to get the job done, the wise senior will adapt himself to the limitations of the junior. He will refrain from demanding from the junior those capacities which panic the junior into inactivity.

The situation also works in reverse. A senior may be self-admiring, arbitrary, and hostile if undue homage is not paid him, or if he senses a critical attitude. He may also be insecure which leads him to doubt the capabilities of his subordinates. He is possibly afraid of making decisions and introducing innovations. He is probably ambitious but not competitive, so he fears to make mistakes, or to have mistakes, credited to him.

Under these conditions the wise junior would more or less consciously evolve a technique for handling the senior. He would become equivocal, instead of forthright. He would not express honest criticism, but would agree with the senior's plans. He would withhold praise of the senior's competitors. He would make it a point to explicitly appreciate whatever good qualities the senior had. The junior would dislike his own behavior but would recognize it as necessary to self and to his men and to get the job done.

In the above cases we see abandonment of the so-called "good leadership" qualities on the part of a senior and a junior who were operating in an environment which rejected these qualities, abandonment for the purpose of accomplishing the military's mission through people. This doesn't mean people should not be encouraged to develop the personal capacities for honesty, loyalty, etc. They should. It means it is misleading to proclaim these capacities alone as inherent traits for leadership.

A second point of view describing

leadership suggests it is behavior to be produced by changing the social and physical environment, as well as military policies. Changes are proposed with regard to procurement of personnel, training, assignment, equipment, selection, retirement, military regulations, Uniform Code of Military Justice (UCMJ) and fringe benefits. The premise is advanced of change the institution and you change the man. The idea is persuasive. It is doubtful, however, even if such changes were made overnight if such action would automatically increase the leadership skills of an individual.

What then is leadership?

Leadership includes both personal capacities and environment. Both of these are a part of it. Leadership is a type of conduct. Conduct is always shared. Conduct is interaction between whatever characteristics of human nature a person is able to produce and his environment, social and natural.

In the military the conduct of leadership requires that a person have the ability (has developed the personal capacities) to respond appropriately, adequately, and responsibly in situations in which he is called upon to produce an authority* role. For, a military officer is commissioned by law to be an authority figure.

It is in producing such conduct that a man induces in others a willingness to follow a line of action desired by him. It is such a man who comes to be known to his subordinates and seniors as a "leader." If his responses are also skillful, the man is often termed a "born leader."

It is therefore said that leadership in the military is the ability to produce adequate, responsible, and appropriate responses of an authority figure in an authority role.

Leadership, as defined above, clarifies much of the observed leadership phenomena. For instance, this definition of leadership ties together the military heroes of our past not because of commonality of abstract qualities, nor because of their being career men, nor because of the discipline and training of their men; but because such men as Washington, Jones, Lee, Grant, Dewey, Pershing, Gilmore and Mitscher in interaction with their environment produced in times of crisis adequate, responsible, and appropriate responses of authority figures to the situations in which they found themselves.

Similarly, in observing leadership in terms of responses, it may be seen that authors in chronicling "what they have done" within the areas of their authority which resulted in better morale and work-accomplishment are really pointing out they have developed the personal capacities to produce appropriate responses to new situations, or adequate new responses to old ones.

Further, leadership as this conceived shows there is no one correct response to situations demanding leadership skills. Dependent upon the capacities of the leader and the environment there may be any number of responses which could be considered appropriate, adequate, and responsible.

Also, this concept of leadership permits an understanding of "situational" leadership. This is the shifting of leadership from person to person as different situations arise. This often occurs most dramatically in times of crisis when the group will turn from the designated leader (say, the Division Officer) to a member of the group who has spontaneously reacted to elements of the crisis in a manner which gained the confidence of the group. Situational leadership occurs informally in the accomplishment of every-day tasks as members of the group seek other members for assistance.

When this shifting of "leadership" is recognized as necessary and is controlled, directed, and used by the designated leader, it results in his being considered a "real" leader by his group members. If the shifting is not controlled by the designated leader, or is resented by him, all matters of complications ensue in both work-accomplishment and interpersonal relations. For, if the designated leader is not capable of producing or providing for adequate responses, the responses will be sought, either consciously or unconsciously, from other sources. The result of such behavior is the gradual undermining of the authority of the designated leader.

Group Action

Consequently, it is a necessity for the military that its designated leaders be able to produce an authority role effectively. The ability to do this is an integral part of the personality of the individual.

If the military is to teach leadership in a manner which will create self-perception of and behavior changes toward being an effective authority figure, then the personality of the student must become a focal point of leadership training at some phase of the instruction.

This is possible today with the use of the group and group action methods.

For an understanding of how to use group action methods for acquiring skills in producing an authority role, let us use the Concept of Roles* as a frame of reference in understanding the group and its members. It is felt that this particular theory may be adequately explained for the purpose of this article by examining a specific social role—the role of a naval officer.

The naval officer role may be easily distinguished at first glance from other social roles, such as the role of a teacher, a minister, a physician, a judge. It should be understood that these roles are differentiated partially because of stereotypes. Most people have vague, generalized, and sometimes popularized ideas of what a naval officer is, how he behaves, and even what he looks like.

Also, the role of a naval officer is well-defined in many situations. In addition to being competent in his knowledge of naval science, he is expected to be a leader in the formal sense of the word. (He is designated a leader by law. He is an authority figure. Other social roles require that a man be an authority figure: the executive, the principal, the foreman, the policeman.) Also, a naval officer by instrument of orders is assigned to perform specific tasks, which further delineates his role.

Thinking in the terms of the behavior which a man produces in his various life roles, it may be seen that there are both similarities and differences of behavior from role to role. For example, it is not expected in performing in the role of a naval officer that a man will be required to assume the responsibilities of an investment banker. For like reasons the Ship's Clerk is not responsible for conning a ship during combat. The behavior a man is expected to produce in a given situation is quite formally defined.

Now, it is quite obvious that there are a great many possible relationships which may exist between the many roles produced by one man. Many times the relationship is a conflict between roles. For example, the desire to play the role of a friend may conflict with the requirement to produce the role of a naval officer. If the conflict exists in a situation which clearly calls for the production of the naval officer role, a response to the situation in the friend role would be inappropriate and probably detrimental to the best interests (group goals) of the Navy.

It is important to understand that roles and role relationships cannot be clearly separated in actual life situations. They are interwoven with a high degree of complexity and integration to form patterns of conduct and to provide for personal capacities.

Problems arise from the fact that exceedingly few people can produce a role spontaneously* in the situation in

*The word is authority, not authoritarian.

*The Concept of Roles as well as the group action methods described herein are the unique contributions of J. L. Moreno.

*Not to be confused with instantaneous, impulsive, or instinctive.

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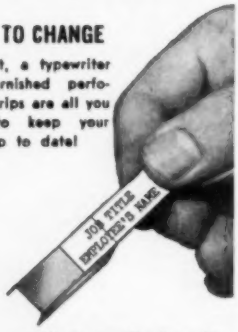

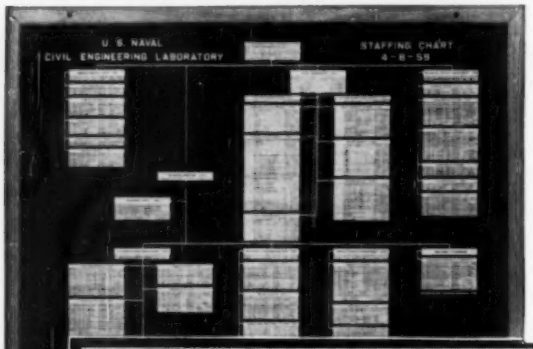

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which it is called for. In addition most men do not have well-defined in their minds the role and role relationships encompassed in their beings. This is illustrated frequently in military situations with newly commissioned officers. An ensign or second lieutenant in attempting to produce the role of a junior officer in a situation with a senior officer will all too often inappropriately respond as if in a son-father situation and confusion begins. From then on almost every response and counter-response is inappropriate and inadequate.

Often, in fact almost universally, young men entering the military show an inability to separate or subordinate their personal feelings from or to the expectations or requirements of any military situation. They react to a military situation in a manner which closely approximates original relationships and behavior patterns in the home or college community. They consistently confuse the role required of them as military officers with the roles they have produced in past situations. Further, the role they are required and expected to produce in officer training situations is a role quite different from that which they are expected to produce as junior officers on the job. It is little wonder that many junior officers report to their first duty station unable to produce the authority role of a military officer.

Here lies the crux of human relations problems and leadership problems. Frequently patterns of behavior become so "pat," so stereotyped, so conserved that they prohibit an appropriate response to a new situation.

Here lies the difference between adequate and inadequate leadership skills.

It is in this area of difference that the group and group action methods offer the best technique for teaching a person how to perform in the role of a military officer.

Students may learn by methods of lecture, movies, discussion, buzz groups and role playing what is expected of them as military leaders. This is circumscribed in the words of an officer's oath and commission, in military regulations, in UCMJ, and more recently in the Navy in General Order #21. But these methods do not teach a student *how* to perform in that role.

Group action methods do. They may be used to teach a person how to be spontaneously appropriate in a role; how to not apply to new situations old responses which may not be adequate. They teach a person to develop the capacity for self-appraisal and understanding of his own be-

(Continued on page 44)

Procurement Trends

Role of New Defense Supply Agency

In spite of statements to the contrary, the newly established Defense Supply Agency will not do any buying on its own, but merely act as a centralized, policy making and monitoring agency sitting on top of the whole single manager concept.

The confusion has resulted in at least three members of the Project 100 study group suggesting internally that the group be maintained as an advisory board to DSA to see that the operation is initiated in the manner intended.

Another suggestion, coming from one of Military Traffic Management Agency's top management types, was that the Secretary of Defense pick five or so "old-timers" from the various agencies that were incorporated into DSA and let them set up policies and procedures.

DSA to Expand Operation Rapidly

Soon to be added to Defense Supply Agency sphere of influence will be chemical tools, industrial tools, and aeronautical spare parts, giving the agency surveillance over $21-billion of DOD personal property—half of the dollar value of all personal property in the DOD inventory. Efficiency derived from the move is expected to produce a one-time saving of half a billion dollars, and an annual saving of $20-million.

Shake-up in Contract Procedures

Secretary of Defense McNamara has, in effect, issued an order to I&L procurement people to "get away from over reliance on cost plus fixed fee contracts." Result: added pressure on CAPR personnel to come up with an improved "greater risk" type of contract, i.e. more profits for excellent performance, greater risk of red ink or marginal effort. The change is some time off, since the new contract form must be devised and procurement officers trained on how to write them with precision.

Computering the Budget

In devising the new "program package" budget, DOD Comptroller Charles J. Hitch has been unable to come up with enough time on any of the Pentagon computers to handle the effort. New computers may be ordered shortly.

However, the full use of computers for program packages won't be realized until the complete program is well underway. Said Hugh McCullough, Deputy Assistant Secretary (Comptroller) for Programming, "certainly we will need computers. We must have here aggregates of performance data so we can respond to choices or alternatives. It will be a decision laboratory, or better yet, a storehouse to enable man to see what effect changes will have. We want to get the system first and then the machines. We want to make sure that we don't have the machines controlling the system."

Under Scrutiny

OSD Installations and Logistics Office is currently conducting an informal survey on what the defense industry is doing to give maintenance problems increased attention. One purpose of the survey is to insure that maintenance experts are brought into project developments in the early design stages, and that upkeep costs are given just as much consideration as design. The cost of maintenance amounts to 20 percent of the annual DOD budget, and requires 650,000 military personnel to perform.

PENTAGON PROFILE

"First you must have the ability . . ."

"THERE IS an old saying in the Corps of Engineers: A good civilian contractor can make you look like a hero; a bad one can make you look terrible."

Thus does Army Brig. Gen. Alvin C. Welling, drafted into the Air Force missile program by Department of Defense to push U.S. missile base construction and activation at "combat speed," describe the basic philosophy he brings to his new job as Deputy for Site Activation.

As an engineer corpsman who has found his fate "inextricably interwoven" with that of private industry throughout his 28 years of service, Welling finds his *modus operandi* naturally matches that of his new boss, Maj. Gen. T. P. Gerrity, head of the Air Force Systems Command's Ballistic Systems Division.

Brig. Gen. Alvin C. Welling

Deputy for Site Activation
Ballistic Systems Division

"The ICBM site activation program is more complex than just construction," says Welling. "It cuts across the industrial board, depending upon manufacturing and deliveries from the plant. It confronts American industry with a demanding challenge, and by American industry we mean the indispensable small business as well as the giant firms. They are our partners."

Although Welling's position as an Army officer with a key staff position in an Air Force outfit is unique, he is no tyro when it comes to working with and for the Air Force. In World War II he served in China-Burma-India operations, building, among other things, B-29 bases. Following the war, he was Engineer of the Tactical Air Command for a year, supervising rebuilding, renovating and maintenance of 43 air bases throughout the country. He also headed a joint Air Force-Army team which reconnoitered the entire eastern half of Africa on a top secret mission. He now insists that he is as much a part of the Air Force as do Air Force officers.

The slight, intense 50-year-old graduate of West Point and the Minnesota Institute of Technology, admits that when he first got into the site activation business "I looked for the end run or the long pass."

"But I found none," he says. "This is a grueling job. Progress must be slugged out on the line. It's as simple —and as difficult—as that."

Welling is no stranger to this idea, either. He recalls an assignment 20 years ago when he was in charge of the southern sector of the Alcan Highway in Alaska "and the directive came down to push the job to the limit of endurance of the troops."

"That is the directive on this job," he says. "It prevails throughout the Ballistic Systems Division. The forces here are heavily engaged in a combat operation."

Welling, who was awarded the Legion of Merit for solving the most difficult location problem on the Alcan project—the route through the Canadian Rockies—believes the "combat operation" feeling must prevail not just at the site but among his immediate staff members as well.

"This is a unique assignment in stateside duty," he said, pointing out that on other assignments, including that of Engineer Commissioner in the District of Columbia, such things as personal appearance were important. "But when people asked me here about what uniform or dress was required, I said I didn't care what they wore or even whether they combed their hair or shined their shoes—production is all that matters."

"In this business," he likes to say, "there is only one color—green. The thrill in missile development is the shot. For us the thrill is seeing those consoles light up in green—not red or amber, but green."

Known as a methodical, hard driver, Welling's method of directing his staff is: "First, carefully define their jobs, then give them room to operate. They are allowed a wide range of discretion."

Keeping pressure on is his third rule. This he does by making frequent personal inspections in the field. "I'm the traveling member of this outfit," he says, estimating that he traveled an average of 18,000 miles a month when he first took over the job.

Another basic rule is to be the first to know about any failures or shortcomings. "When anyone comes to me and complains that we've got leaky valves or bad concrete somewhere, I like to be able to tell them I knew about it four days ago," he said.

A look at the size and geographic distribution of what have been called "the world's biggest guns" shows why Welling has had to cover so much ground. As he points out, "site activation is big geographically." A Minuteman project of three squadrons, for example, is spread over an area 150

miles long and 100 miles wide. To visit each site headquarters for one hour by automobile would require a trip of about 1500 miles over a period of 19 days, working 12 hours a day.

The widespread geographic dispersion presents the Site Activation Task Force with monumental problems of organization and control.

"Only the advent of the jet airplane and the use of tie lines right out to the project permitted the efficient, effective operation of such an decentralized, streamlined construction organization," Welling said.

It's also a tremendous task technically. Scattered about at a site under construction are giant sections of "plumbing" in which men and equipment will be buried underground. These and other launch site components must be fitted into the excavations with unusual precision in order to match a weapon as sophisticated as an ICBM. There are, for instance, such matters as LOX cleanliness and handling of propellants at a rate of 5000 gallons per minute at −300 degrees F.

"In many ways we are attaining the delicate precision of an instrument laboratory," Welling points out.

What really complicates the task is the overriding requirement for speed in everything. Welling's staff is designing and constructing the facilities and performing installation and checkout while the weapon is being developed.

"Our job goes on in the face of fluid, uncertain conditions normally associated with a combat operation," he says. And sometimes the construction phase cannot be completed before the installation and checkout phase begins.

Contractor personnel serving under Welling's supervision currently total about 18,000. This is in addition to the 2900-member staff of the Corps of Engineers Ballistic Missile Construction Office in Los Angeles, and more than 300 Air Force officers and other personnel at missile sites throughout the country. At the peak of installation and checkout, the contractor force is expected to be nearly doubled.

To meet the urgency of his task, Welling says he has "invented a new phrase."

"For me, the term 'inspection' is too passive for the kind of work our forces have to perform out on these projects. So I use 'engineering control.' If you inspect something, the connotation is that you can reject it. But in this business we don't have time to reject—it has to be right the first time."

Along with this must go the courage to admit imperfections, he adds. "First you must have the ability to recognize them, then the courage to admit them, and then the ability to eliminate them." ■

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Leadership . . .

(Continued from page 40)

havior. They point up the dynamics which apparently have a bearing on one's responses. They create an awareness of one's own response patterns and of those of others.

Secondly, the group setting is appropriate because group action methods, in addition to training an isolated individual, permit a group of individuals to be trained simultaneously and in an effective manner.

The training of both group members and an individual occurs *only* if the group members are able to relate themselves to the action being portrayed by an individual. Consequently, training is greatly facilitated by using in training sessions incidents from the actual day-to-day life of the student in a military training environment. Further, inasmuch as the purpose of the training is to increase an individual's leadership skills, the scope of the action should normally be limited to leadership situations: i.e., relationships between juniors and seniors, seniors and seniors, and peers. Also, the more that the basic behavior patterns associated with human relationships are examined in these situations, the greater is the amount of group identification with the action.

To oversimplify the processes of group action methods, the procedures are to have a member of the group act out (reconstruct in action) in front of the group a situation which has actually happened to him in military training. The situation may be an incident in which the student was in an authority role, such as Section Leader or Drill Leader. Or, it may be an incident in which the student was the recipient of direction from an authority figure. In any event, it should be a situation in which the student did not feel at ease, was not satisfied with the outcome of the situation. The same situation might be presented several times with the student assuming the various roles of the other people whom he has chosen to portray. Or, the situation may be presented as it occurred and was interpreted by the student, with other students assuming the roles of the other person/s as the action progresses.

After a particular situation has been developed, members of the group are called upon to identify themselves with the various roles and feelings and attitudes which have been exhibited.

In doing this members of the group derive a great deal from the action and post-action discussion. In relating and identifying with the action it is as if they were seeing some aspect of their own beings unfold before them. The intensity with which they relate to the situation may be measured in terms of their own enthusiasm or, equally important, reluctance to comment about that they have seen and heard. In addition, the teacher (who must possess professional training in group action methods) may contribute from his professional knowledge comments designed to get the student to see subtle aspects of his behavior which may not have been readily apparent to him before the action. It is a highly sophisticated training method. The entire process produces a more objective basis for understanding one's conduct as the understanding is not preconceived but learned in the situation.

What Comes Later

The process would, however, lack real meaning for the group if it were not for the action. The impetus gained through warming-up to discussion through action is lost if the sessions simply open with a discussion, or if the action is a hypothetical situation not personally identified with the group.

There is some question as to the amount of "carry-over" in this type of training. Do the behavior changes produced by the sessions last? It has been assumed by educators from the beginning of time that true learning will be utilized in future situations. It is likely that a man responds in any given situation to the best of his abilities at any given *moment*. Self-recriminations and questions as to, "Why did I do that? Why did I say and do that? Why didn't I say and do so-and-so?" come later. Self-justification and rationalizations come even later.

The action methods of the type discussed herein differ from the "canned" role-playing problems currently used in military officer training programs in four distinct ways: (1) the canned role-playing problem is a hypothetical situation, although it may have happened at one time. It is not born out of a here-and-now situation for the group; (2) the canned role-playing problem leaves the individuals involved in the portrayed situation with the psychological defense, "Well, this really didn't happen to me. In the real situation I'd do it differently."; (3) the canned role-playing problem does not focus its attention on the group as a whole. It does not make maximum use of group interaction, because the personalities with an exploration of the personal capacities of the group members are not made a focal point of the process. In group action methods the group deals with a personalized situation in which the individual himself is highly involved.

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Newsletter

Armed Forces Management Association
Washington 25, D.C. Phone: ME 8-1071

National President: Hon. Thomas D. Morris **Exec. Vice Pres.: RAdm. Thomas B. Neblett, USN, Ret.**

Elections of National Officers

The Association is fortunate in securing the services of a distinguished panel of National Officers and Directors elected by membership ballot in August.

Honorable Thomas D. Morris, Assistant Secretary of Defense (Installations and Logistics) is National President and Chairman of the Board, and has announced appointment of the following:

Vice Admiral George F. Beardsley, USN, Chief of Naval Materiel, National Vice President and Vice Chairman.

Vice Presidents:

***Plans**—Mr. Edmund D. Dwyer, Chief Navy Management Office

Programs—Colonel Fred F. Vreeland, USAF, Management Analysis, D/AF

Chapters—Major General Chester R. Allen, USMC, Quartermaster General U.S. Marine Corps

Publications—Mr. Howard K. Hyde, Office of the Comptroller, OSD

National Conference—Mr. John F. Burke, Director of Civilian Personnel, Hqs. Fifth U.S. Army and President Great Lakes—Chicago Chapter

Secretary—Mr. I. M. Greenberg, Office of the Deputy Chief of Staff Personnel, D/A

Treasurer—Mr. John F. Snyder, Office of the Comptroller, OSD

Elected to the Board of Directors:

Major General Chester R. Allen, USMC; Vice Admiral George F. Beardsley, USN; Mr. Thomas A. Callaghan, Jr., Aeronutronic Systems Inc., Division of Ford Motor Company; Vice Admiral E. W. Clexton, USN, (Ret.), Grumman Aircraft and Engineering Corp.; Vice Admiral O. S. Colclough, USN, (Ret.), Dean of Faculty, George Washington University; Mr. Edmund D. Dwyer*, Chief Navy Management Office; Rear Admiral Lot Ensey, USN, Deputy Comptroller of the Navy; Mr. F. W. Hallaghan, Department of the Air Force; Mr. Howard K. Hyde, OSD; Mr. J. Robert Loftis, Administrative Assistant, Office of the Secretary of Defense; Mr. Rawlings S. Poole*, OSD; Major General W. O. Senter, USAF, Assistant Deputy Chief of Staff Materiel/DAF; Mr. Eldon E. Sweezy, Executive Assistant to the Chief R&D D/A; Lieutenant General David W. Traub, USA, Comptroller of the Army; Lieutenant General Arthur G. Trudeau, USA, Chief of Research and Development D/A; Colonel F. F. Vreeland, USAF, Management Analysis, Department of the Air Force; Mr. Robert H. Willey, Administrative Assistant, Secretary of the Army; Lieutenant General Roscoe C. Wilson*, USAF, Deputy Chief of Staff R&D D/AF; Dr. Edward G. Witting, Cannon Electric Company.

Vice Admiral Harry E. Sears, USN, (Ret.), now a partner in the firm of Calhoun, Hughes and Sears, has accepted appointment as Special Advisor to the Board of Directors.

**Past National Presidents:*

Additional Appointments

To be announced in the near future. Included in the plans for FY-62 is the setting up of committees on Personnel Administration, Budget and Fiscal, Command Control Systems, Management Engineering, and others of particular interest to the various segments of our membership. Comments and recommendations are invited.

Eighth National Conference

National Headquarters is in the process of mailing individual Conference Announcements to the membership. Registration card is included. In addition a supply of announcements will be mailed to each chapter and to many interested commands for wide distribution.

Armed Forces Industrial College

National Headquarters is in the process of mailing descriptive material and application forms for two important courses offered by the Industrial College. These are: "The Economics of National Security," a correspondence course, and "National Security Seminars 1961-1962," a schedule of two-week Seminars to be held in various locations throughout the country by teams from the Industrial College.

Thomas B. Neblett

ARMED FORCES MANAGEMENT ASSOCIATION
Washington 25, D. C.

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Fall Meeting — 25, 26 October, Chicago

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Employer _____

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Registration includes participation in General Sessions, and admission to exhibits.

☐ National Banquet, 25 October (Reception and Dinner) ___ $6.50_____
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(Circle dates desired — Committee will secure reservations and notify you)

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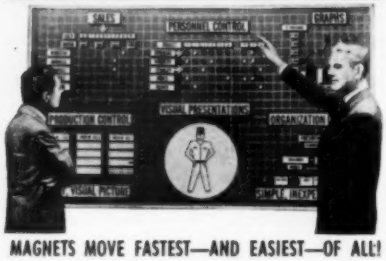

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Leadership . . .

(Continued from page 44)

Personalities are not dodged. They are dealt with as an integral part of the training situation; (4) the director of group action methods must be trained in the disciplines of the method. In the hands of untrained persons these methods could be dangerous. However, in a sixteen week period, five professionally trained directors could effectively conduct a training program of 3000 students.

Fear of the training method because it deals directly with the personality is not warranted. All training methods are attempts to reach the personality. This method simply achieves results and in a minimum length of time. It is an appropriate method for today's military.

Today's military is different from yesterday's. Gone is the authoritarian system whose acceptance on the part of both officers and men made leadership skills less necessary (not less important) than today. Gone is an officer group whose four years of intensive education and indoctrination produced officers who reflected a high degree of conformity in relation to their military duties and the authoritarian system. Gone is a stable personnel population to whom the military was their food, their clothing, shelter, their home and their way of life.

It is required in today's military, in this period of "transient" junior officers and enlisted personnel who are "volunteers" in name only, to employ training methods appropriate to today's personnel situation.

In this day of "quickie" orientation in Officer Candidate School and of divided vocational interests among ROTC and NROTC students, it is imperative that the young men be adequately trained for the leadership responsibilities which are to be placed upon them. It is unfair to these young men and to their future subordinates and seniors to do otherwise. Through action methods junior officers may be trained to the end that when they report of duty they will produce the authority role effectively and will enjoy their military duties.

The young men coming into the military must be taught in a manner which produces results how to conduct themselves as leaders. It is essential that they be able to produce an authority role effectively. Their position demands that they be taught how to be firm, just, consistent and competent; that they be appropriate, adequate, and responsible in all situations in which they assume the military officer role. ■

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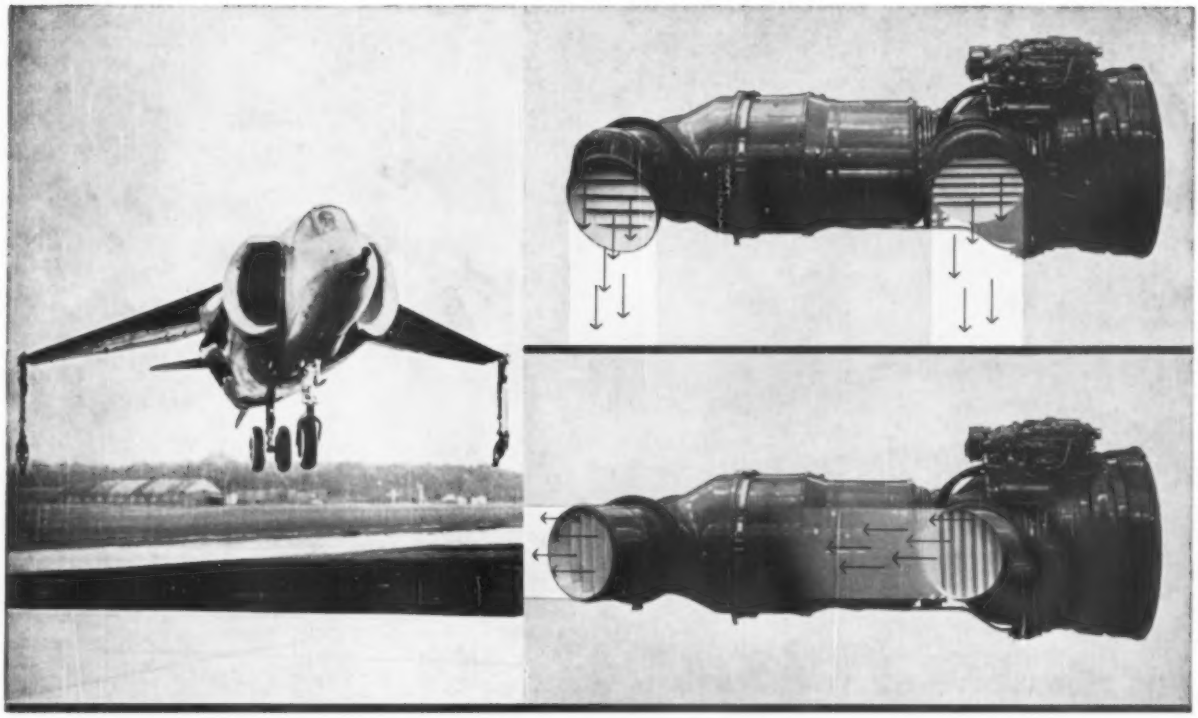

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This two-engine, two-man, Mach 2+ fighter holds world speed records for 500, 100, and 3 kilometers, has crossed the continent in 170 minutes, reached an altitude of 98,560 feet and has a dash speed in excess of 1500 mph. Combat equipped, the Phantom II operates easily from existing 5000 foot runways.

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